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Surname, Initial(s). (2012). Title of the thesis or dissertation (Doctoral Thesis / Master's Dissertation). Johannesburg: University of Johannesburg. Available from: <http://hdl.handle.net/102000/0002> (Accessed: 22 August 2017).

**THE AMBIT OF COPYRIGHT PROTECTION FOR WORKS GENERATED BY
ARTIFICIAL INTELLIGENCE**

by

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Submitted in partial fulfilment
of the requirements for the degree



in the
UNIVERSITY
OF
FACULTY OF LAW
JOHANNESBURG
at the

UNIVERSITY OF JOHANNESBURG

SUPERVISOR: PROF W ALBERTS

2020

ACKNOWLEDGEMENTS

To my parents, Michael and Kerry thank you for providing me with this opportunity to pursue my LLM. You both continue to be the biggest believers and the greatest support for all your children's dreams. I could never thank you enough.

Thank you to my beautiful sisters Tasmin and Courtney for your unwavering belief in me that I would complete this task and to my Gran for your prayers and constant support.

To my dear friend Gabriella Narotzky thank you for your guidance, wisdom and knowledge throughout this process and for taking the time to assist in editing this dissertation.

Prof Alberts thank you for your patience and understanding throughout this lengthy process. Your exceptional knowledge in intellectual property law has been such an inspiration and guiding force.

Above all, thanks must go to God Almighty for providing me with the opportunity, perseverance and ability to complete this task.



ABSTRACT

There has been a rise in technological advancements, specifically the implementation of Artificial intelligence (AI) across a multitude of industries. One of the advantages of AI and its advanced capabilities is to incorporate this in and/or have this assume control over some or all of the processes in the generation of works. This minor dissertation seeks to discuss the issue of works generated by Artificial Intelligence (AI) that would in the normal course qualify for copyright protection. The preliminary issue arising from AI in the spectrum of copyright is whether such works so generated, are in fact awarded copyright protection and if so, who or what is awarded ownership of the work. Copyright protection and ownership is put into question specifically due to the fact that the generation of the work may be viewed as too far removed from the human author.

AI incorporates machine-based learning with autonomous systems that have the ability to learn and produce outputs that were not specifically programmed by a human. Computer programmes designed for machine-based learning utilise a built-in algorithm allowing it to learn and adapt to data input. What sets advanced AI or machine-based learning apart is that although programmers can set perimeters, the work is in fact generated by the computer programme itself. These outputs created by AI are autonomous and can be free from human intervention. This has transcended from the traditional principle that a computer programme is merely a tool and that ownership can be attributed to its author.

Computer programmes embedded with an element of AI have the ability to create otherwise copyrightable works which are the result of the direct intent of the programmer. There is however, the technological reality that more advanced AI exists which has the potential to be embedded to adapt, interact, learn and otherwise result in outputs that could never have been directly intended or directed by a programmer or user.

This minor dissertation additionally examines works generated by AI and whether such works meet the requirements of the South African Copyright legislation. The relationship between the programmer and the outputs generated by AI are also further examined. This relationship is compared with foreign intellectual property law positions specifically in the United Kingdom and the United States of America.

The question surrounding AI protected works is becoming increasingly pertinent due to the expedient degree of technological growth and investment into the use of AI. The question of

ownership and protection of works generated by AI has the potential of causing long lasting effects on copyright as a whole as well as on future investment in technological advancement and investment into AI. One can imagine that if outputs generated by AI are not deemed to be protectable by copyright, then corporates and multiple industries will be hesitant to use this as a form of creation and generation of works.



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1. CHAPTER 1: INTRODUCTION

The rise of technology and advancements in artificial intelligence (AI) has brought about an onslaught of legislative questions and the need for legislative development. We are entering an era where AI has the capability to create its own works. This raises the question of ownership of and protection for works where the creator could be seen to be AI.

The *Oxford Dictionary* defines AI as “the theory and development of computer systems and software able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages”.

Technology and software traditionally were always associated with actions that are carried out in accordance with instructions that are controlled, defined and actioned by a human being. In terms of AI, machines mimic the human thought process and use this to execute actions and decisions. The significance here is that AI will not be bound only by the parameters predetermined by a programmer, but rather the capability to learn, adjust and self-adapt. We therefore find ourselves in an age of self-learning and self-generating algorithms.

In this mini-dissertation I focus on highlighting the technological advancements of AI and what this means in the intellectual property sphere, more specifically that of copyright protection and ownership. I discuss a layman’s understanding of AI and briefly differentiate between the concept of weak and strong AI.

I then assess the South African copyright position, wherein copyright is described in *Video Parktown North (Pty) Ltd v Paramount Picture Corporation* as when an idea is conceived by imagination, skill or labour, in a tactile, visible or audible form, which is capable of being communicated as an expressive conception or apprehension of the mind, a right or property in that idea then immediately exists.¹ This is further substantiated by the case of *Payen* wherein the Court determined that a final work is a work ready for use or for commercial exploitation. Requirements such as “effort, labour, skill and ingenuity must be taken into account”.²

¹ 1986 (2) SA 623 (T) 7.

² *Payen Components South Africa Ltd v Bovic Gaskets CC & Others* 1995 (4) SA 441 (A).

Taking into account the copyright requirement for originality, the Court held in *Appleton v Harrischfeger Corporation* that for originality to exist, “there must be a skill or labour by the author in its actual execution”.³ Furthermore, in *Waylite Diary CC v First National Bank* it was determined that the work should not be deemed “common place”.⁴

Taking the South African perspective on copyright forward, I examine the elements of AI-generated works to that of the authorship and originality requirements to the copyright perspective, and briefly discuss the potential owners or authors of AI-generated works and how these positions may eventually be instilled in law. A European and American perspective are briefly applied to the discussion, showcasing how these countries are attempting to incorporate artificial intelligence works within the domain of its current legislative framework.

Significant to the position are what may be regarded as “game changers”, which are shaking the foundations of copyright existence. These game changers raise scenarios where works that in the normal course would be deemed copyrightable have instead been created by non-human or juristic entities.

I lastly deal with the wave of corporate investment that has swept into the employ of AI innovations, this being widespread across a multitude of industries. Corporate investment not only is identified, but the potential risk posed by AI which businesses or any author may face by utilising AI in the generation of works. This mini-dissertation speaks to creating an adaptability method whereby those looking to utilise AI in the creation of their works can do so in a manner that can best ensure copyright protection and ownership.

³ *Appleton v Harrischfeger Corporation* 1995 (2) SA 247 (A).
⁴ 1995 (1) SA 645A 653D.

2. CHAPTER 2: THE RELEVANCE OF ARTIFICIAL INTELLIGENCE IN THE INTELLECTUAL PROPERTY SPHERE

AI is increasingly becoming a driving force in technology and business development across a multitude of industries.⁵ Through digitised data and by constantly advancing computational power, AI technologies are showcasing an ever-increasing presence in global markets, bringing forth the importance of policy progression.⁶ AI's growth in global markets stems from a combination of advancing computational power and digitised data.⁷ There are recorded approximately 340 000 AI-related patent applications and over 1 600 000 AI-related publications.⁸

The study of AI-related patents showcases that a multitude of industries are looking to utilise AI in their commercial exploitations.⁹ Analyses showcasing industries leaning toward utilising AI in their activities include, but are not limited to, industries such as telecommunications, transportation and life and medical sciences.¹⁰ Juristic entities represent a significant majority making up 26 out of 30 of the top AI patent applications.¹¹ There has further been a significant upswing in AI-related acquisitions with 53 per cent of these types of acquisitions originating from 2016.

The World Intellectual Property Organisation (WIPO) issued a revised paper based on various discussions held with member states and representatives from commercial, research and non-governmental sectors regarding substantive legal questions raised by the presence of AI.¹² The discussions highlighted the disruptions caused by AI in the creation, production and distribution chain of goods and services applied in the economy and society,¹³ these distributions thereby linking AI with intellectual property (IP) policy. It is an underlying principle of IP that protection of IP is offered in order to stimulate and encourage progress,

⁵ World Intellectual Property Organisation *WIPO Technology Trends 2019: Artificial Intelligence* WIPO (27/09/2020) 13.

⁶ WIPO (n 5) 13.

⁷ As above.

⁸ WIPO (n 5) 14.

⁹ As above.

¹⁰ WIPO (n 5) 15.

¹¹ WIPO (n 6).

¹² World Intellectual Property Organisation Secretariat *WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI) Second Session Revised Issues Paper on Intellectual Property Policy and Artificial Intelligence 2020* WIPO 2 (27-09-2020).

¹³ WIPO Secretariat (n 12) 1.

innovation and creativity.¹⁴ The revised paper released by WIPO proceeded to document policy issues raised across the IP industry, including questions of inventorship for patents, designs, trademarks, trade secrets and copyright.¹⁵

The aforementioned revised paper found it pertinent to differentiate between “AI-generated” and “AI-assisted” works or outputs. AI-generated is referred to as “the generation of an output by AI without human intervention; in this scenario, AI can change its behaviour during operation to respond to unanticipated information or events”.¹⁶ AI-assisted is defined as “outputs that are generated with material human intervention and/or direction”.¹⁷ Outputs are defined as an invention, work, design or trademark.

Various questions have been raised regarding the impact of AI on IP policy. Specifically, in terms of AI’s impact on copyright, various questions come to the fore. In terms of AI’s impact on policy one needs to consider aspects such as whether there needs to be a differentiation in law between AI-generated and AI-assisted outputs;¹⁸ furthermore, how much human input should be considered material in concluding that a work has been authored by a human.¹⁹ These questions are becoming more pertinent as AI provides a stronger contribution in the process of generating copyrightable works.



¹⁴ n 15.
¹⁵ WIPO Secretariat (n 12) 3.
¹⁶ WIPO Secretariat (n 12) 4.
¹⁷ As above.
¹⁸ As above.
¹⁹ As above.

3. CHAPTER 3: ESTABLISHING A FOUNDATIONAL UNDERSTANDING OF ARTIFICIAL INTELLIGENCE

In establishing the potential impact and potential existence of IP rights that may exist with the emergence of AI, it is essential to have a fundamental understanding of what constitutes AI. A distinction must be drawn between traditional forms of software where every action has been laboriously programmed by a human as opposed to advanced AI which has the capabilities to learn, adapt and self-adjust. WIPO's revised issued paper on IP and AI utilised the definition of AI as a general-purpose technology with extensive application throughout society and the economy at large.²⁰ AI has been defined as mainly learning systems whereby machines, without human interference, can better perform tasks, which tasks would typically require the intervention of humans.²¹ AI has further been considered as being "the study of ideas to bring into being machines that respond to stimulation consistent with traditional responses from humans, given the human capacity for contemplation, judgment, and intention".²²

A founding example of AI in its practical form is the programme known as the "advice taker", as explained by McCarthy in a seminal paper.²³ The theory behind the advice taker is that it can utilise knowledge in order to determine a reasoned action or approach, the theory being that the advice taker does not have to be re-programmed to be improved, but can rather learn through exposure to advice and knowledge.²⁴ The advice taker is compared to what is described as humans having common sense.²⁵

It has further been argued that AI consists of three characteristics, namely, intentionality, intelligence and adaptability.²⁶

²⁰ WIPO Secretariat (n 12) 1.

²¹ WIPO Secretariat (n 12) 19.

²² Shubhendu and Vijay "Applicability of artificial intelligence in different fields of life" 2013 *International Journal of Scientific Engineering and Research* 28; West and Allen "How artificial intelligence is transforming the world" 2018 <https://www.brookings.edu/research/how-artificial-intelligence-is-transforming-the-world/> (25-09-2019).

²³ McCarthy "Programmes with common sense" 1959 *Proceedings of the Teddington Conference on the mechanisation of thought processes* Page 3.

²⁴ McCarthy (n 23).

²⁵ McCarthy (n 23); V Rajaraman "John McCarthy – Father of artificial intelligence" 2014 *Journal of Science Education* 198 204.

²⁶ West and Allen (n 22).

The intentionality aspect entails that unlike passive machines, AI not only is capable of producing pre-determined responses, but it also can combine information from a multitude of sources and then act of its own accord in terms of the data. Therefore, based on this theory AI is designed by humans with intentionality to reach conclusions based on its analysis of accumulated data.²⁷

The intelligence aspect refers to AI used in conjunction with machine learning (a comprehensive description of this is presented further on in this mini-dissertation). Machine learning essentially is a way in which a programme is able to analyse data, identify problems and improve and learn through experience.²⁸

Most significantly, the third characteristic is what is referred to as adaptability, which provides for AI that learns and adapts in order to make decisions.²⁹ This form of AI will adjust and shift in accordance with changes in circumstances. In theory this form of AI will integrate these changes in its calculations and analysis and will then execute decisions in order to adapt to the new possibilities and/or outcomes.

During the initial exposures to the notion of AI it was assumed that if a machine was exposed to the same data as a person and then went on to produce outputs that mirrored human behaviour, this machine was then considered to possess artificial intelligence.³⁰ Based on this postulation, AI works were previously created to produce works in line with the human creativity process. Coupled with technological developments, further research and exposure to the uses of AI, researchers and those invested in the AI industry now believe that the concept of AI takes on a completely different stance than having to simply mirror the humanly accepted outcome. For AI to be creative, it is theorised that this would require the machine to exhibit “computational creativity” by processing input data in such a way that the outputs generated result in novel and innovative combinations of pre-existing ideas and information.³¹

Theorists on a basic level have differentiated between two forms of AI, namely, that of

²⁷ As above.

²⁸ McAfee and Brynjolfsson *Machine Platform Crowd: Harnessing Our Digital Future* New York (2017) Chap 3.

²⁹ McAfee and Brynjolfsson (n 28).

³⁰ McGinnis “Accelerating AI” 2010 *Northwestern University Law Review* 366.

³¹ McGinnis (n 30).

narrow or weak AI and broad or strong AI.³² Although both concepts would involve source codes having AI imbedded into the programme, the differences between weak and strong AI may be the catalyst in developing a copyright protection model for works generated by AI.

3.1. An assessment of weak and strong artificial intelligence

3.1.1. A foundational understanding of narrow/weak artificial intelligence

Weak AI is the more traditional form of AI which produces results that rely heavily on the input, control and creativity of the human programmer. This form of AI is also referred to as expert systems that set about to achieve a task for which it was programmed or designed and the output will therefore be predestined.³³ In summary, this form of AI is not seen as autonomous in the sense that it does not have the ability to develop or decide on its own actions and is lacking the creative element.

This form of AI acts in ways that have been decided upon by the human programmer. Weak AI does not possess the ability to learn and create unpredictable or unforeseen results. Weak AI, therefore, is predominantly bound by the inputs of information provided by the human programmer. Weak AI constitutes a form of machine learning focused on performing a fixed and restricted task. The AI in this instance is supplied with specific big data to supply this one predetermined task. For example, weak AI will be utilised when this mini-dissertation is submitted to a programme to evaluate and calculate percentages of plagiarism. The same weak AI, however, will not be able to, for example, also determine fraudulent credit card transactions.³⁴

Weak AI includes a programme that is programmed and designed to act humanly but ultimately is limited to the ambits in which its programmer sees fit to imbed and control. This in essence is a bespoke programme that utilises AI to reach and achieve a predetermined

³² Mialhe and Hodes “*Artificial intelligence and robotics in the city*” 2017 *Field Actions Science Reports* paras 8-9.

³³ Yanisky-Ravid “Generating Rembrandt: Artificial intelligence, copyright, and accountability in the 3a era: The human-like authors are already here – A new model” 2017 *Michigan State Law Review* 659 672.

³⁴ Issaias “Artificial intelligence and its insatiable appetite for data: Can privacy law in the European Union keep up with artificial intelligence systems in its dealings with big data?” *Academia Edu* para 3.1 https://www.academia.edu/44541836/Artificial_Intelligence_and_its_Insatiable_Appetite_for_Data_Can_Privacy_Law_in_the_European_Union_Keep_Up_with_Artificial_Intelligence_Systems_in_its_dealings_with_big_data_ (03-12-2020).

conclusion.

3.1.2. A foundational understanding of strong artificial intelligence

Strong AI is a form of programming that does not have a programme that acts and appears to be human, rather meaning that the machine in essence thinks for itself. This concept of the machine working in autonomy is in contrast to the theory of establishing where the AI can mirror humans. The theory of strong AI rather aims at an even higher result and level of intelligence.³⁵

AI utilising what is called neural networks operates in a mimicking fashion to that of the human brain. Information accumulated by the AI finds and creates connections and links between the data.³⁶ Neural networks in a way are nurturing AI to learn how to do and achieve certain acts. These networks permit AI to learn through experience, that is, through failure and success.³⁷ Should the AI be given a goal, the system can adapt and structure different outputs until it reaches the desired outcome. Fundamentally, the game changer here in AI adaption is that this form of AI could learn and achieve goals through exposure to large volumes of data and no other form of human contribution.³⁸

Strong AI is fed a vast amount of big data and through the use of neural networks, it is able to adapt and provide results that are unpredicted and, in some instances, not even envisioned. This form of AI is still fitting a required function to examples presented before it, but it also incorporates heightened pattern matching, which uses multiple functions to match a pattern.³⁹

3.1.3. Strong artificial intelligence coupled with machine learning

Strong AI incorporates machine learning that is an off-shoot of artificial intelligence, operating on the basis that systems can learn from data, make decisions, and identify patterns exclusively from human involvement. This form of learning focuses on training the machine

³⁵ McGinnis (n 30) 369.

³⁶ Yanisky-Ravid (n 33) 675.

³⁷ Yanisky-Ravid (n 33) 675.

³⁸ As above.

³⁹ Yanisky-Ravid (n 33) 675.

to learn.⁴⁰ Deep learning is a further off-shoot of machine learning which, combined with neural networks, identifies and learns complex patterns that are imbedded in vast volumes of data.⁴¹ Machine learning is currently finding use in multifaceted industries such as finance, medical, transport and retail, to name but a few.

Strong AI with the utilisation of neural networks and machine learning positions towards creating machines that do not need menial human programming to reach a desired effect, but in which a programme can learn through experience and not through continuous human intervention.⁴²

In conjunction with machine learning AI has the potential to source and identify patterns in data, and uses this to make future predictions and/or make decisions resulting in unforeseen circumstances.⁴³ Machine learning at surface level may be divided into three categories, namely, supervised learning, unsupervised learning and reinforcement learning.⁴⁴ In terms of supervised learning, the machine is provided with a set-out labelled input to output pairs and the goal is to provide a mapping between these.⁴⁵ Here, there is significantly more contribution by the human programmer.

Unsupervised machine learning is not provided with a set output or goal. The machine is only provided with inputs of information, the goal herewith being that the programme sources unusual patterns and connections in the data, a form of knowledge discovery.⁴⁶

The third type of machine learning, labelled as reinforcement learning, is where the programme formulates outputs based on reward or punishment signals.⁴⁷

It is somewhat symbolic that not only is AI imbedded in the title of this dissertation but AI will be a determining factor in whether this *dissertation is accepted*. Unsupervised learning will play a role as this dissertation is submitted through the University's appointed anti-

⁴⁰ WIPO (n 5) .

⁴¹ As above.

⁴² As above.

⁴³ Murphy *Machine Learning: A Probabilistic Perspective* (2012) 1.

⁴⁴ Murphy (n 43) 2.

⁴⁵ As above.

⁴⁶ As above.

⁴⁷ As above.

plagiarism programme. This is a very real and practical example of unsupervised learning where the learning algorithm is unlabelled and the algorithm is asked to identify patterns in the input data.

3.1.4. Analysis based on the differentiation between weak and strong artificial intelligence

What is prominent here in the differentiation between weak and strong AI is the concept of the input and control that the programmer will have when designing weak AI. Some would argue that the contributions made to the development of a weak AI programme should be considered a form of skill, effort and labour input into the work and generating the end result. Legal theorists have also deemed that AI simply is a family member of the pen, paint brush and keypad, thus nothing more than a tool utilised by the author in their efforts to create the work.

It may be possible that in future legislators may separate the skill, effort and judgment imparted by human programmers in creating original source code and the outputs generated by autonomous actions of AI. In an age of AI generating autonomous outputs, it may be that legislators will not attribute copyright protection to these outputs produced by AI. The skill, effort and judgment exhibited by human programmers in the original source may be considered too far removed from the influence of the AI in producing the final works. Therefore, it may be that the source code is only eligible for copyright protection and not the outputs generated by the AI.

3.2. The fundamentals of artificial intelligence operations

3.2.1. A layman's understanding of the way in which artificial intelligence operates

We know that weak AI (although able to produce significantly efficient programmes) is a form of AI that works as a direct reaction to the human inputs being presented to it. At the other end of the spectrum is strong AI, the operations and capabilities of which are inspired by human biological functions, more specifically in line with neural workings.⁴⁸

⁴⁸ Yanisky-Ravid (n 33) 675.

Similar to the human brain, artificial neural networks learn through increasing or decreasing the prominence of specific code depending on the output this generates. Therefore, like the human brain, advanced AI will increase and reinforce code or neural networks that present a desirable outcome and will attempt to rid or weed out undesirable connections.⁴⁹

A practical example of AI in use is the creativity machine engineered by Stephan Thaler. This machine incorporated neural networks and independently-developed patentable inventions and composed music. The creativity machine incorporated two types of neural networks. The first network consisted of data it learned through training, whereby the data allowed the machine to generate noise and static. This first network could then utilise the data it had accumulated through training in order to fill the gaps in the sounds and static it was generating. Briefly, the second network would then proceed to analyse the data and outputs and then adjust the limits and parameters of the first network, so as to ensure the most successful outcome or performance.⁵⁰ These creative machines have seen heightened advancement, used in the United States military to design new weapons. The heightened advancements in these machines have the ability to learn and train with the bare minimum human intervention or programming.⁵¹

Unlike previous technologies, AI is distinguished by its ability to act separately and independently. There are already many functions that AI can perform without human assistance or even oversight, such as the applications within the banking sector (the “Pepper” financial advisor AI bot used by Nedbank, as discussed later on in this mini-dissertation) or self-driving cars.

A particular study conducted on breast cancer research serves as an apt example of AI utilising data to arrive at conclusions independent from human contribution. During the initial stages of the study scientists suspected that the study of stroma (being tissue around cancerous cells) studied in conjunction with actual tumours could assist in the diagnosis of cancer. During the course of the study an AI cancer pathology learning machine titled C Path was utilised in generating results of the study. In contrast to what the scientists believed, this

⁴⁹ As above.

⁵⁰ Clifford “Intellectual property in the era of the creative computer programme: Will the true creator please stand up” 1997 *Tulane Law Review* 1677-1679.

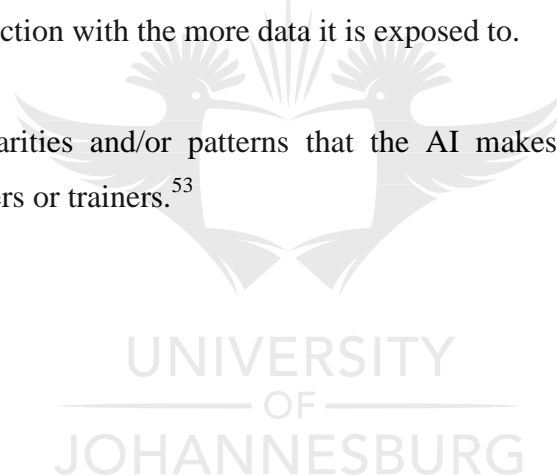
⁵¹ Acosta “Artificial intelligence and authorship rights” (2019) <https://jolt.law.harvard.edu/digest/artificial-intelligence-and-authorship-rights> [28 August 2020].

AI programme determined that the physical characteristics of the stroma were a better indicator of breast cancer than the actual cancerous cells themselves.⁵²

One manner in which the AI functions, among many, is to mirror the human process of perception in three initial steps:

- (1) A multitude of examples are shown to the algorithm, for example, pictures of animals or faces coupled with the pictures' correct classifications. These are then classified by the algorithm through patterns of similarity.
- (2) The algorithm goes on to break down the data into miniscule electronic signals and then attempts to link patterns or connections, without being "told" where to look or what, specifically, to look for.
- (3) The algorithm results and accuracy continuously improve through experience in conjunction with the more data it is exposed to.

The connections, similarities and/or patterns that the AI makes may not be completely understood by the viewers or trainers.⁵³



⁵² Scherer "Regulating artificial intelligent systems: Risks, challenges, competencies, and strategies" 2016 *Harvard Journal of Law and Technology* 353 363-365.

⁵³ Yanisky-Ravid (n 33) 676 677.

4. CHAPTER 4: THE SOUTH AFRICAN COPYRIGHT LAW POSITION

4.1. The foundational building blocks to South African copyrightable works

Copyright protection in South Africa is not subject to a registration process. The reigning source of legislation governing copyright protection in South Africa is the Copyright Act (the Act).⁵⁴ The Act makes provision for specific works that can be afforded copyright protection, for example, literary works, artistic works and computer programmes.⁵⁵ In order for a work to be awarded copyright protection, such work must be provided for in the Act. Ownership of copyright is subject to the provisions of the Act and the ownership conferred by sections 3 or 4 of the Act on any work shall vest in the author or, in the case of a work of joint authorship, in the co-authors of the work.⁵⁶ An author, as defined and referred to in the Act, must amount to a qualified person, which means that the author needs to be a South African citizen or form part of the Berne Convention or have their domicile in South Africa. This requirement is also met if the author is a legal entity registered in South Africa or is published in the requisite manner.⁵⁷

Most notably, the Act defines an author as a “person”. As this is not explicitly defined in the Act, one needs to turn to the statutory definition of a person, which suggests that in the event that a literal approach cannot be adopted, one must follow a purposive approach. Therefore, the dictionary meaning of a person amounts to an individual. By applying a purposive approach to the Act, it would appear that both natural and juristic persons are afforded protection under the Act.⁵⁸

An emphasis should be placed on the fact that the Act makes no provision for an author being anything other than a human being or a juristic entity registered within the Republic. Therefore, no clear provision is made for any other being, whether this be an animal or something akin to AI, having the capacity to be declared an author, thus assuming ownership of copyright.

⁵⁴ Act 98 of 1978.

⁵⁵ s 2.

⁵⁶ s 21(1)(a).

⁵⁷ s 3(1)(a)(b)

⁵⁸ Copyright Act (n 54).

A copyrightable work must further meet the originality requirements, comprising sufficient labour, skill and judgment. These requirements must have been embedded into the completion of the work and the work will not be eligible for copyright unless it has been reduced to a material form.⁵⁹

Specific to this mini-dissertation is authorship provided for in the Act for works that are computer generated. Authorship of such works is considered to lie with “the person by whom the arrangements necessary for the creation of the work were undertaken”.⁶⁰ A computer programme is a work specifically included in the Act. A computer programme is defined as “a set of instructions fixed or stored in any manner and which, when used directly or indirectly in a computer, directs its operations to bring about a result”.⁶¹ The author of a computer programme is defined to be someone who exercises control over the creation of the computer programme.⁶²

4.1.1. The Copyright Amendment Bill

The Copyright Amendment Bill (Bill)⁶³ provides for proposed amendments to the Act, specifically by replacing section 19B of the Act pertaining to the general exceptions regarding the protection of computer programmes.⁶⁴ The Bill defines interoperability as “the ability to exchange information and to use the information which has been exchanged”.⁶⁵ The inclusion provides that a person with the right of use to the computer programme can “without the authorisation of the copyright owner, observe, study or test the functioning of the programme in order to determine the ideas and principles, which underlie any element of the programme if that person does so while performing any of the acts of loading, displaying, executing, transmitting or storing the programme, which he or she is entitled to perform”.⁶⁶

One of the aims purported in the drafting of the Bill was to accommodate changing technology. It must be noted that no specific and direct mention has been made to AI in the

⁵⁹ s 2(2).

⁶⁰ s 1.

⁶¹ As above.

⁶² As above.

⁶³ Copyright Amendment Bill Draft 3 2018.

⁶⁴ Copyright Act (n 54).

⁶⁵ Copyright Amendment Bill Draft 3 2018.

⁶⁶ s 19B(1) Copyright Amendment Bill Draft (n 63).

proposed new legislation.

4.1.2. *Analysis*

For the purposes of this discussion and in terms of protecting AI-generated works, I support the notion that the proposed legislation in fact will make the study and utilisation of AI-generated works much easier for competitors in the industry.

If one brings the aforementioned impact of the proposed legislation to grass-roots level, this will entitle the purchaser of a computer programme to analyse and study the source code in order to perform acts entitled to that person upon the purchase of the code or product. The Bill goes on to state that the “information obtained through the application of the provisions of subsection (2) may not be used for any other act which infringes copyright”.⁶⁷

Taking into account the aforementioned provisions, it may be argued that competitors seeking to harness AI outputs, but simultaneously wishing to circumvent copyright infringement, will not look to slavishly reproducing the source code. I believe that the above clause inserted in the Bill makes it simpler for competitors to study and harness as much information as possible from the source code and ultimately the AI outputs.

Coupled with the aforementioned provisions, competitors can now simply buy the computer programme or product and, as such, are entitled to analyse, learn and view elements of the source code. This can then assist them in utilising the AI outputs and imbedding this in their own “original” source code. Should AI outputs not be subject to copyright protection, the competitor’s analysis of the source code of the work, so as to better understand the AI outputs, will not constitute an act that infringes on copyright.

4.2. A study of the South African copyright requirements applied to artificial intelligence works

AI-generated works pertain to the creation of an output by AI without human intervention.⁶⁸ AI-assisted outputs refer to the creation of outputs with assistance by AI but under direct

⁶⁷ s 19(3)(d) Copyright Amendment Bill Draft (n 63).
⁶⁸ WIPO Secretariat (n 12) 4.

human supervision and intervention.⁶⁹ A comparative analysis is conducted below to determine the use of AI and its potential compliance with the requirements for copyright protection. There has been an emergence of AI as a general purpose technology with extensive application throughout the industry.⁷⁰ If we compare works reduced to a material form that are created by AI and the requirements for copyright protection, two fundamental requirements come to the fore, namely, the human authorship and originality requirements.

4.2.1. *The human author versus the artificial intelligence author*

Ownership as per the Act is conveyed on the author.⁷¹ Should the creation of a work be deemed to be AI assisted or AI generated, then the validity of the copyright protection and the identity of the author may be called into question. In terms of the Act, an author is defined as either a natural person or juristic entity registered in the Republic.⁷² The autonomous and independent capabilities of AI and the way in which these advanced algorithms operate with a lack of human intervention calls into question ownership.⁷³ If, for example, a programmer cannot showcase that they exercised the requisite “control over the making of the computer programme”,⁷⁴ then the programmer may not be the author.

4.2.2. *Originality versus contribution of artificial intelligence*

AIs are more accomplished than simple mirroring machines, and are only capable of copying works. Advanced AI has exhibited the innate ability to be creative and produce unforeseen and completely original works above and beyond man-made barriers and preconceptions.⁷⁵ AI utilises computational data and intelligence to analyse relevant data and attempts to solve specific problems and meet goals. AI systems decompose data into manageable and divided data chunks, which are then consolidated to create new and sometimes unexpected works. The principles of skill, effort and labour constitute the existence of copyright, and are exhibited here by the fact that AI can actively search for and accumulate more data. The fact

⁶⁹ As above.

⁷⁰ WIPO Secretariat (n 12) 1.

⁷¹ s 21 Copyright Act (n 54).

⁷² Copyright Act (n 54).

⁷³ Davis “The AI revolution: Is the future finally now?” 2017 *Network World* <https://www.networkworld.com/article/3189964/the-ai-revolution-is-the-future-finally-now.html><https://www.arnnet.com.au/article/617707/ai-revolutionfuture-finally-now> (14-06-2019).

⁷⁴ s 1 Copyright Act (n 54).

⁷⁵ Yanisky-Ravid (n 33) 722.

that AI has the ability to learn, process data, recognise similarities and patterns and, in essence, consistently evolve, may speak to the evolvement of AI providing significant input and skill to the generation of the work.⁷⁶

4.2.3. Analysis of the copyright requirements

AI is not considered to qualify as a human or juristic entity and, on the face of it, no copyright protection can be awarded to a work where the AI has superseded the role and contribution of the human programmer or juristic entity. Should a work be created through AI assistance or AI generation to the extent that any human intervention cannot be said to have contributed to ownership, then the work cannot be said to have been created by an author.

The uncertainty surrounding the authorship requirements relate to either the work not being provided copyright protection, or to the fact that an alternative author needs to be appointed, such as the programmer behind the AI. In considering the advancements of AI, it would appear that certain strains of AI could meet the originality requirement with minimal human input and intervention.



⁷⁶ McGinnis (n 30) 369.

5. CHAPTER 5: SHAKING THE FOUNDATIONS OF WHAT IT IS TO BE COPYRIGHTABLE

5.1. Identifying game changers in the global environment

AI technologies have been progressed through increased developments in computational power, connection and the availability of large volumes of data.⁷⁷ AI has already been impacting industries such as transport, health and finance and this impact has a direct effect on the applications people use.⁷⁸ Governments and legislators will be required to develop legal policies that encourage and foster competitiveness but also safeguard people's interests.⁷⁹ The nature of these fast-paced emerging technologies may result in a lack of regulatory frameworks guiding governance over this. Due to the fact that such emerging technologies are in their infancy and the implications thereof often are unknown, legislation must then be based on verifiable facts.⁸⁰ It is suggested that policy governing AI developments should seek to encourage AI research and investment and provide for issues such as transparency, privacy and verifiability.⁸¹

5.1.1. Resurrecting Rembrandt

Entities of the likes of ING, J Walter Thompson Agency, Microsoft, Tu Delft, Mauritshuis and Rembrandthuis collaborated in a project to bring one of the world's most prolific painters back to life. The concept behind the project was to determine whether an algorithm, if correctly created, could mirror the work and style of Rembrandt and produce a physical work in the Rembrandt form.⁸² The work is a three-dimensional printed generated painting developed through a facial recognition algorithm.⁸³ The process lasted approximately 18 months and consisted of data analysed by over 346 known Rembrandt paintings.⁸⁴ A purpose-

⁷⁷ WIPO (n 5) 19-20.

⁷⁸ WIPO (n 5) 120.

⁷⁹ WIPO (n 5) 125.

⁸⁰ As above.

⁸¹ As above.

⁸² Schlackman "The next Rembrandt: Who holds the copyright in computer generated art" 2016 *Artrepreneur Art Law Journal* <https://alj.artrepreneur.com/the-next-rembrandt-who-holds-the-copyright-in-computer-generated-art/>, <https://alj.artrepreneur.com/the-next-rembrandt-who-holds-the-copyright-in-computer-generated-art/> (11-06-2019).

⁸³ Guadamuz "Artificial intelligence and copyright" 2017 *World Intellectual Property Organisation* https://www.wipo.int/wipo_magazine/en/2017/05/article_0003.html (01-10-2019).

⁸⁴ As above.

built database was structured and compiled of 168 263 fragments of Rembrandt's original works. This data base was a springboard in which all 148 million pixels were analysed and combined to create the work.

In order to achieve this goal, software was designed that was aimed at understanding the style of Rembrandt by using a facial recognition algorithm that would identify and classify the most typical geometric patterns used by Rembrandt to paint human features.

Rembrandt's entire collection of work was analysed in order to achieve this data, and materials such as three-dimensional scans were upgraded through deep learning and/or machine learning which heightened the resolution and quality.⁸⁵ Software was further developed to identify and classify the most common geometric patterns used by Rembrandt. The advanced machine learning would then utilise learned principles in order to replicate and generate new facial features for the painting.⁸⁶

Once the algorithm identified the commonly-used techniques and created individual human features, it was then tasked to combine this into the final portrait. In order to do this, the algorithm used percentages and measurements in an array for data gathered from Rembrandt's prior works in order to determine the facial feature proportions and distances implemented in the new work.⁸⁷ The individual features were then scaled, rotated and modified by the advanced algorithm; all in accordance with the "Rembrandt style" it had learnt.

Prior to determining ownership of the work, one would first establish whether the work itself qualifies as a copyrightable work. This is done by assessing whether the work is provided for in the Act, reduced to a material form and is original in that skill, effort and labour have been imbedded into the work.⁸⁸

⁸⁵ As above.

⁸⁶ ING Presents "The next Rembrandt" 2016 *YouTube*
<https://www.youtube.com/watch?v=IuygOYZ1Ngo&t=3s> [<https://perma.cc/L4PR-NZNC>] (11-06-2019).

⁸⁷ As above.

⁸⁸ Copyright Act (n 54).

5.1.2. *Analysis of the artificial intelligence Rembrandt work*

At first glance one may assert that the new Rembrandt work is not original as the aim was to utilise the style of Rembrandt.⁸⁹ However, this particular work is not a stock standard reproduction of pre-existing Rembrandt work but rather a composite of different works and the significant style of Rembrandt. In essence it is a compilation of Rembrandt's creative style along with a calculated analysis of a likely Rembrandt portrait. Imperative to this is the fact that the algorithm utilised the compiled data of Rembrandt's works in order to bring this to a conclusive image and final work. The significance here is that although the humans and programmers may have been familiar with the data and aspects of this data, fundamentally the team had no idea what the final image or portrait would look like.⁹⁰

The work itself has been reduced to a portrait which was conducted through advanced and specialised three-dimensional printing techniques. The requirement that the work must be reduced to a material form, therefore, is met as the work is a physical and tangible thing. With the various contributions and efforts showcased by the various team players, the question of skill, effort and labour would not be called into question. However, as with works generated by AI, it is unclear to whom one would attribute the efforts, skill and labour exerted in the outputs generated by the AI. Linked to this is the question of authorship as this would typically denote a human or juristic entity. Should the AI outputs not be considered to be the skill, effort and labour of the team, then as the AI output generated the work, the question arises as to who owns the final work.

Attaining copyright protection ensures that the author has the right to and authorises others to reproduce the work, distribute the work, publicly showcase the work and refrain others from using and/or otherwise benefiting off the work.⁹¹ Beyond this, intellectual property rights are historically thought to stimulate and encourage innovation and growth through the knowledge that these works are afforded protection.

Should a non-human or juristic entity be afforded these same rights, they would not have the capacity to encourage stimulation, growth and innovation. In addition, these alternative

⁸⁹ Schlackman (n 82).

⁹⁰ As above.

⁹¹ Yanisky-Ravid (n 33) 700-703.

entities would lack the capacity to ensure and enforce its protection, for instance, by the institution of legal proceedings,⁹² thus making the point in awarding protection redundant.

5.1.3. Monkey “selfie” monkey “do”

In the case of *Naruto v Slater*⁹³ the defendant (Slater), a wildlife photographer by profession, left his camera unattended in a nature reserve. A Macaque monkey (Naruto) proceeded to take multiple photographs of himself (the “monkey selfies”) with Slater’s camera.⁹⁴ The monkey selfies were subsequently published by Slater and Wildlife Personalities (Wildlife). The publication itself indicated that copyright protection and ownership over the monkey selfies were awarded to Slater and Wildlife.

The People for the Ethical Treatment of Animals (PETA) proceeded to institute legal proceedings on behalf of Naruto to obtain copyright ownership for Naruto in respect of the monkey selfies, which would then be administered by PETA on Naruto’s behalf. It was alleged by PETA that Naruto had suffered economic harm as a result of Slater’s infringing copyright. PETA sought to redress the alleged infringement by seeking an order declaring Naruto the author and owner of the monkey selfies.

The question presented before the Court was whether a monkey may sue humans, corporations and companies for damages and injunctive relief arising from claims of copyright infringement.⁹⁵ The Court applied the findings in *Cetacean Cmty v Bush*,⁹⁶ in which it was determined that animals have jurisdictional standing. However, there was a further requirement to determine whether an animal had statutory standing in terms of the applicable legislation, in this instance being the Copyright Act.⁹⁷ The findings of *Cetacean* applied a rule of statutory interpretation, namely, that if an Act of Congress simply states that if one animal has statutory standing, then all animals have statutory standing.⁹⁸ In the absence of the statute clearly providing for the standing of animals, it follows that non-humans would be considered as lacking statutory standing. In this case the Court held that the Copyright Act

⁹² Yanisky-Ravid (n 33) 700-703.

⁹³ 16-15469 (9th Circuit 2018).

⁹⁴ As above.

⁹⁵ As above.

⁹⁶ 386 F.3d 1169 (9th Cir 2004).

⁹⁷ *Naruto v Slater* (n 93) 14.

⁹⁸ *Naruto v Slater* (n 93) 16.

does not expressly provide for standing in the case of animals and that, therefore, through its application of *Cetacean*, *Naruto* lacked standing.⁹⁹

5.1.4. Analysis of the effects of these global game changers

From the aforementioned examples it is clear that a standard principle is set in which a copyrightable work needs to have been created and authored by a human. I agree with the current copyright law position in the United States that works created by a human are protectable, but if a computer creates the same work, this will not constitute copyright protection. In applying the findings in the aforementioned case, it appears that a line is drawn between human works and AI works.

The challenges facing copyright in the AI era is a multifaceted and global issue, where legislators may appear to be lagging in comparison to the fast-paced technological progression. It is inevitable that the difference in national legal systems need not only be understood, but will have to be adapted specifically for globalised companies with a foot in multiple markets. Technology companies will need to have a real look toward a global perspective in ensuring full and adequate compliance with all copyright implications.¹⁰⁰

A surface level view of AI and the work it has generated may simply be that a computer programme, although advanced, simply remains only a computer programme. The fact, however, remains that advanced AI and its capabilities have made an impact on the way in which society, juristic entities and legislators view not only the law but also possible advances and advanced possibilities. On the face of it, it may appear absurd that the question of copyright protection and rights being awarded to AI are even brought into question. In the words of Ron Augustus from the Microsoft team, with reference to the Rembrandt project, “[d]ata is used by many people today to help them be more efficient and knowledgeable about their daily work, and about the decisions they need to make. But in this project it’s also used to make life itself more beautiful. It really touches the human soul.”¹⁰¹ These words perfectly encapsulate the fact that the works generated by AI do not simply bring about an

⁹⁹ *Naruto v Slater* (n 93) 17.

¹⁰⁰ Fischer “Are copyrighted works only by and for humans? The copyright planet of the apes and robots” 2014 *Duane Morris New Media and Entertainment Law* <https://blogs.duanemorris.com/newmedialaw/2014/08/18/arecopyrighted-works-only-by-and-for-humans-the-copyright-planet-of-the-apes-androbots> [<https://perma.cc/C9Z5-X5AY>] (11-07-2019).

¹⁰¹ n 87.

analytical or autonomous response but rather can evoke the same human emotions that would appear in works generated by humans.



6. CHAPTER 6: A LEGAL OVERVIEW OF VARIOUS JURISDICTIONAL POSITIONS

6.1. An overview of UK and USA foreign law positions

6.1.1. *The United Kingdom's position on ownership of artificial intelligence works*

The United Kingdom's Copyright, Designs and Patents Act 1988 (UK Act)¹⁰² sets out that in the case of a literary, dramatic, musical or artistic work that is computer-generated, "the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken".¹⁰³ In accordance with this stance any works created by AI and the accompanying accountability would be assigned to humans developing AI.¹⁰⁴

6.1.2. *An overview of what appears to be the United States' present stance on the inclusion of artificial intelligence incorporated in copyright works*

The rules regulating the US Copyright Office provide that the Office will not register a work created purely by a machine or mechanical process. A fundamental requirement for registration of a work is the presence of human contribution towards the creation of the work. The Federal Court of Australia conferred a judgment in the case of *Achos Pty Ltd v Ucorp Pty Ltd*,¹⁰⁵ which judgment aligns itself with the aforementioned position held by the US Copyright Office. The Court held that a work generated with the intervention of a computer could not be protected by copyright as it was not produced by a human.¹⁰⁶ The practices of the US Copyright Office seek to instil the practice that copyrightable works must originate by human intervention and ultimately be awarded to the human author.

In the case of *Community for Creative Non-Violence v Reid*¹⁰⁷ the Supreme Court held that the author of a work is someone who has reduced the idea or intangible thing into a material form.¹⁰⁸ Similarly, in the case of *Uranti Foundation v Maaherra*¹⁰⁹ the Court held that

¹⁰² Act of 1988.

¹⁰³ UK Act (n 104).

¹⁰⁴ Yanisky-Ravid (n 33) 691.

¹⁰⁵ [2012] FCAFC 16.

¹⁰⁶ *Achos* (n 107).

¹⁰⁷ *Community for Creative Non-Violence v Reid* 490 US 730 (1989)

¹⁰⁸ 490 US 730 (1989).

ownership remained with the first humans who effected the arrangement and provided input into generating the work.¹¹⁰ Solidifying the American view is the case of *Aalmuhammed v Lee*,¹¹¹ which held that the author of a work will in all likelihood be a person.

In order to study and monitor the impact and consequences arising from technological advancements, the American Congress formed the National Commission on New Technological Uses of Copyrighted Works (CONTU), which went on to publish a report in 1978.¹¹² The report concluded that works could not be seen to be created autonomously by computers as a computer simply is a passive tool of creation; the theories surrounding AI advancement and developments were not at that stage deemed to be concerning. At the time the report was published there was no solidified basis to even conceptualise that AI could provide such considerable input as to be considered an author of the work. The report ultimately created the perception that the need for creativity and originality is ingrained in copyright works and that such requirement could not be met by a computer system.

6.1.3. *An analysis of the aforementioned foreign law positions*

On the face of it, it would appear that the United Kingdom and the United States have corresponding legislative positions on the ownership of copyright by AI. If the legislation in both foreign jurisdictions is considered as it currently stands, there is a clear position that only a human entity may constitute the author of a work and, therefore, be the subsequent owner of any copyrightable work. The United Kingdom's copyright legislation would appear to support the view that programmers of the computer programme or source code would be the author entitled to ownership of the works created by the AI.¹¹³ Furthermore, precedent set out in United States case law would purport that the copyright will only come into existence and be awarded to the human behind the work.

In terms of the American position the doctrine entitled "Work for hire" has been used as an argument for AI ownership of copyright works. The aforementioned doctrine requires a human to obtain copyright but allows a non-human entity to hold this copyright through this

¹⁰⁹ *Uranti Foundation v Maaherra* 895 F. Supp. 1347 (D Ariz 1995).

¹¹⁰ 895 F. Supp 1347 (D Ariz 1995).

¹¹¹ 202 F.3d 1227 (9th Cir 2000).

¹¹² Risher "The National Commission on New Technological Uses of Copyrighted Works (contu)" https://www.tandfonline.com/doi/abs/10.1300/J123v02n02_04 [16.04.2020].

¹¹³ UK Act (n 104).

“Work for hire” doctrine.¹¹⁴ This doctrine will be employed in instances where, for example, an employee within the course and scope of their employment goes on to create a copyrightable work. The hiring organisation will be entitled to reap the benefits of the copyright protection. Thus, the employee is a form of conduit whereby the copyright protection passes through to the juristic entity.¹¹⁵ On the face of it, the “Work for hire” doctrine may appear to provide a clear pathway for the ownership of copyright works to fall to an AI akin to that of a juristic entity.

I would, however, argue that this is not the case, as a juristic entity, unlike AI, is able to register copyright, promote the work, encourage stimulation and progress in the works, as well as commercial competition. I believe that these are some of the requirements that form the foundational basis for the need and existence of intellectual property protection.

6.2. An overview of the current South African position

6.2.1. South Africa today

There has been great enthusiasm in embracing artificial intelligence in South African businesses and business products, which can be applied to anything from behaviour analysis to streamlining. However, at the current pace of advancement, policy and law makers have battled to keep up with legislation and regulation. As indicated above, the governing of AI is an issue that stems across the board leaving global law makers grappling with challenges such as regulation without stifling an age of technological ingenuity.

Given this reluctance, the general approach has been for countries to put AI “strategies” into place and the widely-varying focuses might be on research, development, morality, infrastructure and regulation as seen in the wide spectrum of such approaches. At present there are 23 countries that have adopted such AI strategies, including the African countries Kenya and Tunisia. To date there has been no form of AI governing policies in South Africa. In April 2019 President Cyril Ramaphosa selected key players for the Presidential Commission on the Fourth Industrial Revolution (4IR Commission) the mandate of which is

¹¹⁴ Pearlman “Recognizing artificial intelligence (AI) as authors and inventors under US intellectual property law” (2018) *Richmond Journal of Law and Technology* 15-16

¹¹⁵ Pearlman (n 115) 16.

to assist the government in this regard, while ensuring that opportunities in this space are not foregone. Chaired by the President himself, the Commission will assist in establishing relevant policies and strategies to enable South Africa to remain competitive in the global sphere.¹¹⁶ This Commission is aimed at creating a policy document to guide South Africa's growth in the midst of the Fourth Industrial Revolution.¹¹⁷

6.2.2. *Analysis of the South African view*

As it stands, the current copyright legislation positions itself that should the work generated be autonomous, this would be indicative of originality and not simply a form of commission. In these instances the autonomy of the AI can lead to unexpected results.

Alternatively, the current legislation has left a gap for certain work to be considered a commission and the person or juristic entity that commissioned the work would then be entitled to the rights surrounding this. I argue, however, that significant factors would need to be shown in arguing that an AI work was commissioned. The commissioner would have to prove that the end result was not only foreseen, but in fact was the desired result. In addition, there needs to be proven considerable skill, effort and labour injected into the work in order for this to find favour within the Act. This then begs the further question of whether a commissioner could argue that they possess the rights to the work despite this being generated by AI. The AI then could simply be seen as a conduit for achieving the desired result.

¹¹⁶ n 99.

¹¹⁷ As above.

7. CHAPTER 7: DETERMINING POTENTIAL OWNERS OF ARTIFICIAL INTELLIGENCE COPYRIGHTABLE WORKS

7.1. Potential candidates awarded ownership protection

This mini-dissertation has provided a surface level differentiation of two types of AI, namely, weak and strong AI. It follows that the answer as to who owns the works generated by AI may differentiate substantially in accordance with the genus or type of AI and the different levels of human contribution.¹¹⁸

Due to the fact that there may be such a multi-layered level of contribution to the works of AI there not necessarily is a “one-type-fits-all” approach as to who is entitled to benefit as author of the AI works.

As there is such a significant number of players contributing to the works, such as programmers, suppliers, system operators and holders of the AI, to name but a few, it is argued that this drastically lessens each individual contribution and weakens the bond between the programmers and the works created by the AI.¹¹⁹

Regardless of the various viewpoints and arguments put forward, I argue herein that there will never be a stock standard answer to ownership where autonomous or any form of AI is at play.¹²⁰

Discussed below are three possible forms of authorship of these AI copyrightable works. These forms of ownership are those most commonly considered and argued and each has its own merits. It is conceivable that with the various players contributing to the AI works, not to mention the AI itself creatively and autonomously generating results, the question of ownership will become pertinent with the onslaught of technological breakthrough. Legislators alike need to brace themselves for an epidemic of AI legal battles and questions posed to the very foundations of our intellectual property laws.

¹¹⁸ Yanisky-Ravid (n 33) 697.

¹¹⁹ As above.

¹²⁰ Samuelson “Allocating ownership rights in computer-generated works” 1985 *University of Pittsburgh Law Review* 1185 at 1226-1228.

It has been argued that AI consists of three predominant characteristics, which are the very reason that authorship is called into question. These characteristics can be summarised as follows:

First, in many instances the results generated by the AI can be unique, creative and unexpected. At times the programmer of the source code may not have even predicted or been aware of the end result.¹²¹

Second, AI is not stagnant or contained within the confines of the programmer's domain. AI utilises data that is presented to it and uses this to learn, adapt and change.

Third, arriving at the results engendered by AI is similar to travelling in uncharted waters. The results are often surprising and new, as the AI itself is capable of evolving in accordance with new data with which it comes into contact.¹²²

In essence one could argue that should the works generated by the AI instead have been created by a human being, one would not even question the copyright eligibility of the works.

7.2. Analysis of ownership candidacy

It is imperative to distinguish between a computer programme and a source code. This dissertation does not put into question the validity of copyright protection for this form of traditional and stagnant software. In fact, the dissertation takes it as a given that in the event of computer programmes, a programmer or its employer or commissioner (as the case may be) is entitled to the benefits accrued under copyright protection. However, in terms of AI outputs and in achieving somewhat of an answer as to who owns the copyrights to these, it is my argument that the source code or computer programme needs to be completely differentiated from the AI outputs. The Act makes specific provision for the protection of a computer programme. The ownership and copyright ability of computer programmes are not called into question when assessing AI outputs.

The first step in determining the owner/author of a work will depend on each given

¹²¹ As above.

¹²² As above.

circumstance. Further to this, a distinct line needs to be drawn between the source code and the AI outputs. Once this line has been drawn, some form of clarity may prevail, when one can work towards accommodating and/or adapting their generated AI outputs in order to ensure that the works are protected by copyright and that the ownership of this falls into the right hands.

The question legislators face in terms of regulating intellectual property rights around AI may have gut-wrenching effects on the investment in AI, the works produced by AI and technological advancement as a whole.

When taking into account the basic characteristics of AI as provided above,¹²³ it may be argued that although programmers may be entitled to ownership rights, these rights cannot automatically vest in the outputs of AI as they would in a more stagnant computer programme that has been completely developed and controlled by the programmer.

7.3. A brief description of the three main role players that are commonly referred to as the owner to AI works

7.3.1. The user

A traditional approach has always been to assign copyright ownership to the creator of the work despite them using a machine or tool to generate this. In essence, the tool or machine could simply be seen as an extension of the human creator's thought process, actions and physical being.

The American CONTU report of 1978 made prolific provisions when it stated:

The computer, like a camera or a typewriter, is an inert instrument, capable of functioning only when activated either directly or indirectly by a human ... The computer affects the copyright status of a resultant work no more than the employment of a still or motion-picture camera, a tape recorder, or a typewriter.¹²⁴

¹²³

As above.

¹²⁴

Samuelson (n 122) 1195.

Should this approach be followed in the literal sense, and this would purport a very literal interpretation of governing legislation, the user would acquire rights to the work as the outputs would be considered a direct result of the originality and efforts of the human user.

This approach could work in line with South African legislation based on the literal approach as well as the ability to persuade the court that irrespective of the ownership question, the works in themselves constitute works protected in terms of the Act.

It follows that arguments against the user as owner would bring forth the advancements made in AI technology, and the concept that the AI is able to generate autonomous results. Furthermore, the application of machine learning, deep learning and neural networks all constitute the perception of an AI striving for a higher and more self-aware self. These arguments would depreciate the stance of the user as the owner.¹²⁵ The coming into effect of advanced technologies and the concept that AI is one small step for mankind, begs the question of whether AI could and should be considered to be the owner.

7.3.2. *The artificial intelligence*

The mere suggestion of AI having the *locus standi* to have ownership rights brings about a myriad of further issues and questions. On the face of it and in accordance with the requirements as set out in the South African Act, if AI were to be granted ownership rights, this is akin to constituting AI as a human, which in itself could ignite a whole range of legal disputes raising ethical and moral questions. Further to this concept, if AI were to be considered so advanced as to be categorised in relation to sentient beings, it could be argued that the AI should for all intents and purposes have the capacity and foresight to move ahead and make its own trade mark and patent applications, just as a human or juristic person would in due course.

AI being attributed with ownership rights may have further economic consequences as the AI may lack foresight and capacity to grow and develop the work. A further consideration is

¹²⁵ Fischer (n 100).

how one would compensate or incentivise the AI for the use of the protected work.¹²⁶ If AI is awarded ownership over works and humans are unable to secure permission to use the work and cannot compensate for the use of the work, the question arises as to whether this would mean that all AI works must remain stagnant for the period in which copyright subsists.

7.3.3. *The programmer*

I agree with the argument that the programmer is the owner of the AI work. Although not without challenges, it may be a highly-adaptable form of ownership that one can connect to the AI's outputs. For the most part, the programmer could argue that the skill, effort and labour exerted in creating the source code and imbedding this code with AI would amount to sufficient effort and knowledge¹²⁷ incorporated into the work, and would result in programmer ownership. However, one cannot forget that the revolutionary aspect of AI is that this did not require the programmer to imbed step-by-step detailed instructions and parameters within the programme.

As detailed above, advanced AI employs an array of advanced learning algorithms such as machine learning and neural networks. The progression and autonomy exhibited by the programmes cannot be brushed aside. Therefore, it would be remiss to set a standard approach whereby programmers are automatically vested with copyright in the outputs of AI.

In order to link the programmer to the outputs generated by the AI, this must be consistent with the requirements for originality as set out in the Act.¹²⁸ Ownership vesting in a programmer will all come down to the programmer being able to substantiate and prove their contribution to the end work.

In instances where a programmer can prove sufficient skill, effort and labour and the programmer in fact was acting in the course and scope of employment, due principles should be followed. In this event the employer or the juristic entity will be the owner of the AI works.

¹²⁶ Bakry and He “Autonomous creation – Creation by robots: Who owns the IP rights?”2015 *Intellectual Property and Knowledge Management* <https://law.maastrichtuniversity.nl/ipkm/autonomous-creation-creation-by-robotswho-owns-the-ip-rights> (10-06-2019).

¹²⁷ As above.

¹²⁸ Copyright Act (n 54).

8. CHAPTER 8: THE CORPORATE CONUNDRUM

8.1. Corporate investment in artificial intelligence

The relevance of AI is clearly positioned in a report commissioned by Microsoft, wherein 112 major companies were surveyed. The data revealed that the greatest degree of investment in AI over the past ten years has occurred in Turkey, the United Arab Emirates and South Africa,¹²⁹ with an estimated \$1 658 million invested in AI in South Africa, which included AI transactions incorporating mergers and acquisitions, the Internet of Things (IoT), social media, smart mobile, scheduling and optimisation.¹³⁰ In the report case studies were conducted on some of South Africa's leading corporations in a multitude of fields.

In the insurance sector, an industry deep rooted with traditional business structures, the insurance conglomerate Discovery confirmed that AI has been a predominant driver of disruption within the industry.¹³¹ In the case study Discovery revealed the use of implemented AI techniques to enhance the customer experience, operational efficiencies, risk management and product development.¹³² MTN, a further conglomerate with its hands in the proverbial AI honey pot, has conveyed a focus in implementing AI strategised for enhanced customer innovation services through voice recognition technology and chatbots.¹³³ Bridgestone Tyre Manufacturing is another South African company restructuring systems with the use of AI to cut costs and improve efficiencies within sales modelling and order processing.¹³⁴

In the report all 112 surveyed companies indicated that AI implementation has begun and the companies are either at the planning, piloting or releasing stage.¹³⁵

¹²⁹ Moller, Matcher and Czaika "Artificial intelligence in the Middle East and Africa outlook for 2019 and beyond" 2019 A Report commissioned by Microsoft and constructed by EY 19 https://info.microsoft.com/ME-DIGTRNS-CNTNT-FY19-05May-26-AIMaturityStudy-SRGCM1070_02ThankYou-StandardHero.html (06-11-2019).

¹³⁰ Moller *et al* (n 131) 21.

¹³¹ Moller *et al* (n 131).

¹³² Moller *et al* (n 131) 21; "How artificial intelligence is shaking up the investment world" 2018 <https://www.discovery.co.za/corporate/smart-money-artificial-intelligence-and-investing> (05-11-2019). This article mentions the use Discovery has made of AI in generating new in-roads into the investment sphere and how this is working towards better customer care and service delivery.

¹³³ Moller *et al* (n 131) 36.

¹³⁴ Moller *et al* (n 131) 41.

¹³⁵ Moller *et al* (n 131) 21.

8.1.1. An overview of the heightened incorporation of artificial intelligence use in the banking sector

All one has to do is peruse the integrated reports of one of the major South African banks to view the positioning and mention of the likes of robotics, digital disruptions, digitisation, automation and advanced technologies.¹³⁶

An AI endeavour specifically worth noting is Nedbank's Pepper, a fully-programmable humanoid robot that incorporates artificial intelligence.¹³⁷ Pepper is being hailed as the future digital ambassador of the Bank. Pepper has the ability to evolve its skills through AI, and give feedback accordingly. It can respond to verbal, touch, environmental and tablet input, and is interactive, progressive and autonomous.¹³⁸

Pepper incorporates AI to provide clients with basic information around Nedbank's products and services, assisting clients with information and advice on lending, money saving and investing.¹³⁹ Pepper is not the only inroad Nedbank has made in the advanced technology sphere. The end of 2018 saw Nedbank pipelining chatbots, robo-advisors and software robotics.¹⁴⁰

Nedbank has confirmed that it has deployed 33 software robots to improve process efficiencies which would reach 200 in number by the end of 2019.¹⁴¹ The majority of banks

¹³⁶ Standard Bank Group “Annual Integrated Report 2018” <https://annualreport2018.standardbank.com/documents/air-2018-annual-integrated-report.pdf> (06-11-2019); see further ABSA Group “Integrated Report 2018” http://absa2018ar.africa/pdf/Absa_Group_2018_Integrated_Report.pdf (06-11-2019). The ABSA report goes on to detail the use of artificial intelligence in not only enhancing the customer experience but also used to enhance security within the bank. See further Investec “Annual Report 2019” Volume 1 Investec strategic report incorporating environmental, social and governance (ESG), and the remuneration report <https://www.investec.com/content/dam/investor-relations/financial-information/group-financial-results/2019/investec-dlc-vol-1-annual-report-2019.pdf> [28.08.2020].

¹³⁷ Doyle “Pepper helps Nedbank lead in digital” 2018 *Itweb* <https://www.itweb.co.za/content/ILn147myL9m7J6Aa> (06-11-2019).

¹³⁸ As above.

¹³⁹ As above.

¹⁴⁰ Nedbank Group “Integrated report for the year ended 31 December 2018” <https://www.nedbank.co.za/content/dam/nedbank/site-assets/AboutUs/Information%20Hub/Integrated%20Report/2018/2018%20Nedbank%20Group%20Integrated%20Report.pdf> (42), the bank having “implemented 51 software robots to date (robotic process automation) to enhance efficiencies and reduce processing errors in administratively intense processes”.

¹⁴¹ Khumalo “Nedbank launches first humanoid robot in SA at branch” 2018 *Business Report* <https://www.iol.co.za/business-report/companies/nedbank-launches-first-humanoid-robot-in-sa-at-branch-13596888> (08-11-2019).

and financial service companies are about to or have released bot advisors so as to not fall behind.¹⁴² It appears that corporations are looking to invest in AI and to not “lag” behind. Take, for example, the likes of Uber and AirBnB which revolutionised their respective industries and left their previously dominant competitors wanting.

The planned banking strike set for 27 September 2019, which subsequently was halted by the Labour Court, was organised by SASBO revolting against the digital disruption of the technology revolution resulting in potentially thousands of job losses for employees in the banking sector. Standard Bank announced that the company would be closing down 104 branches by relying on AI to do the work of humans at a faster rate. Development costs may be high, but ongoing maintenance, development and innovation may be far less than ongoing wage bills coupled with South Africa’s restrictive labour legislation.¹⁴³

Employees of the South African major banks recently proposed to strike against such Banks, due to job losses caused by the implementation of AI systems in the Bank processes.¹⁴⁴ In response to this proposed strike Michael Jordaan (Co-founder and CEO of South Africa’s application-driven bank entitled “Bank Zero” and former CEO of First National Bank) tweeted that “an app can’t strike”.¹⁴⁵

Mr Jordaan may be completely correct in his statement that AI operations will have significant advantages. However, I would argue that consideration needs to be given to the effects of the outputs generated by the AI systems incorporated in the banking systems.

8.1.2. Analysis of potential outcomes caused by artificial intelligence utilised in the banking sector

AI outputs utilised in a bank is a prolific example. If, for example, banking AI starts producing information and outputs based on information, it provides the bank with sufficient insight. Should these outputs become particular to individual banking customers and be able

¹⁴³ Haffajee “Bank workers can’t strike on Friday, but their revolt against the robots has just begun” 2019 *Fin24* <https://www.fin24.com/Opinion/Columnists/bank-workers-cant-strike-tomorrow-but-their-revolt-against-the-robots-has-just-begun-20190926> (06-11-2019).

¹⁴⁴ As above.

¹⁴⁵ As above.

to be personalised containing that client's particular information, it could be argued that the works generated independently by the AI cannot be awarded copyright protection to the bank. This could then create two very serious consequences:

First, the bank cannot capitalise on or protect the works generated by AI that it has specifically imbedded into its systems and processes, and the economic loss for the Bank could be catastrophic.

Second, and perhaps the most significant, the AI outputs independently generated containing clients' private information could fall into the clutches of the public and this information could be syphoned off to any organisation and/or individual. This in essence could expose the bank's clientele to risk and put customers in a vulnerable position, while simultaneously violating consumer protection and privacy laws¹⁴⁶ such as those in the Protection of Personal Information Act (POPI).¹⁴⁷

While Mr Jordaan's comments as referenced above may have merit, I argue that should no consideration be given to the intellectual property rights surrounding the works of the AI imbedded in the bank, I believe that striking bank employees will be the least of the bank's problems.

8.1.3. *Venture capitalists creating a world of artificial intelligence*

For large conglomerates AI represents a transformative business opportunity. In the world of up and coming entrepreneurs, AI is symbolic for opportunities to compete with the larger players in the market.¹⁴⁸ AI presents the opportunity for business transformation. For entrepreneurs, AI is the asymmetric tool to take on much larger competitors. With AI being a relatively new field that is growing exponentially, having been defined as the fourth industrial revolution, this field is becoming increasingly attractive to venture capitalists. The field is a current and fast-paced developing environment in which disruptive technologies such as the Internet of Things, robotics, virtual reality and AI are transforming the way in which we live

¹⁴⁶ Moller *et al* (n 131) 51. This goes on to discuss regulatory requirements being a major concern for corporations utilising AI, specifically adherence to POPI and GDPR.

¹⁴⁷ Act 4 of 2013.

¹⁴⁸ Schoeman *et al* "Artificial intelligence: Is South Africa ready?" Gordon Institute of Business Science, University of Pretoria https://www.accenture.com/_acnmedia/pdf-107/accenture-ai-south-africa-ready.pdf (06-11-2019).

and work.¹⁴⁹

On 23 September 2019 Thomas Cook Group was liquidated by investors in the United Kingdom. The company was established in 1841 as Thomas Cook Tour Operations and grew through a series of acquisitions and mergers. There is much speculation regarding the reasons for the collapse, but it undoubtedly is related to the company's inability to innovate and grow through technology coupled with the costs of keeping branches open on the high streets. This left fixed costs elevated while competitors entered the market and developed online AI strategies for booking flights and holidays without expensive high street rentals.¹⁵⁰

Corporate investment in AI may be traced through all levels of organisations and industries. South African corporates have portrayed keen interest in following the AI track in order to advance and in fear of being left behind. After all the time, money and energy corporate functions and educational programmes invested in this avenue, one wonders what this really means if the laws governing the Republic do not provide for ownership rights of the very works into which these corporates are investing so much.

8.1.4. Analysis of the injection of artificial intelligence used in the corporate space

Regulatory procedure needs to be put in place to govern and clarify the position on AI-generated works. In the absence of regulatory clarity and while operating in a “grey zone”, those persons and corporates utilising AI need to do so within a calculated framework, applying the “mindful” application of AI.

What may be ascertained from the above is that South African courts and legislators have yet to make a definitive decision on the eligibility and ownership of copyright in works generated by AI. AI cannot be awarded ownership rights due to the fact that AI is not considered human or a juristic entity. I question whether the copyright eligibility of the works derive from the skill, effort and judgment applied or from the AI and, therefore, not the human behind the construction of the work.

¹⁴⁹ As above.

¹⁵⁰ Compulsory Liquidation of Thomas Cook Group plc <https://www.thomascookgroup.com/> (20-10-2019).

Mention was previously made of the investment contributions made by corporations that are focused on the creation and utilisation of AI systems.¹⁵¹ As indicated, the issue that corporations may very well face is that if these AI works are not copyrightable or if the corporations themselves are not awarded ownership rights in the works, the question is whether this form of investment will make any sort of financial sense and whether this will pose a risk to exposure of corporate and clients' confidential information.¹⁵²

Notwithstanding the above, and although we may be entering uncharted waters, we have the ability to mould and adapt the unknown to our advantage, as is the answer to nearly every question ever posed in law school, "It depends". Bearing this answer in mind, I argue that devoid of set laws and regulations, in governing works generated by AI, there is significant room to make the current laws and the processes in which AI works are constructed come together in cohesion and generate the desired outcome.

In order to implement this "corporate adaptability" structure, I trust that it is possible to develop a model to determine the degree of computer assistance as a contributor to the copyright process, thus determining the copyrightability of the work, as well as the permissible and recognisable author.

8.2. A copyrightable framework

8.2.1. Establishing the parameters for a copyright framework base

The copyrightable framework sets out to ensure works embedded with AI are generated within a framework to ensure ownership and copyright eligibility. This is done by establishing varying degrees of human intervention.¹⁵³ Then AI-assisted and AI-generated works should be differentiated and analysed to formulate the point where machine learning and AI overlap human contribution, to the point where copyright protection must be relinquished.¹⁵⁴

¹⁵¹ Schoeman *et al* (n 150).

¹⁵² As above.

¹⁵³ McLaughlin "Working paper computer generated inventions" JD candidate, American University Washington College of Law (2018).

¹⁵⁴ As above.

The AI process utilised in intellectual property works may be well illustrated in the patents sphere. For example, let us paint a scenario wherein a person in society identifies a problem and seeks to invent a solution to solve this. This person proceeds to describe the problem and inputs the foreseeable constraints, and then deploys machine learning which utilises the data and arrives at a solution. In essence, the AI has now so to speak invented a solution to the problem and arrived at the desired result.¹⁵⁵

Following from this illustration, it is important to determine the extent of human intervention in the creation of the work. The aim herein is that should one be able to prove sufficient human intervention, that is, skill, effort and judgment, then irrespective of the fact that advanced AI was utilised to generate outputs, the work may still be deemed to be protected by copyright. We know from the discussions above that weak or narrow AI consists of computer assistance where the programmer generally is in control of the inputs and outputs.¹⁵⁶ In this instance, should copyright be called into question, I argue that a sufficient level of human intervention could be proven to ensure that not only the source code is protected but also that of the outputs assisted by the AI. In these instances, it is most likely that the AI has been operating within constraints set out by the programmer. Additionally, the programmer most likely has some insight into what the end result will look like.

In terms of strong or general AI, this is recognised in works where data is channelled to the AI which then produces a result which the programmer could never have foreseen.¹⁵⁷ The lack of human intervention may be crippling to a corporation's or an individual's copyright dreams, as these works do not arrive at a pre-determined result but rather one that supersedes human forethought, which may mean that the works slip out of the copyrightability sphere.

8.2.2. *Creating a boundary to artificial intelligence copyrightable works*

Bearing in mind that the requirement for a human or juristic entity as author¹⁵⁸ is the prohibitive barrier, we need to determine what will amount to adequate human intervention. It is a difficult concept as the law has not yet expressly stated that AI works lack copyright capacity. However, if we work on this premise, a solution for corporates would be to adapt

¹⁵⁵ As above.

¹⁵⁶ As above.

¹⁵⁷ As above.

¹⁵⁸ s 2 Copyright Act (n 54).

the process of creating AI works to ensure that they showcase sufficient human intervention so as to be declared copyrightable.

Entities with an interest in ensuring copyright protection for works generated by AI should look to the existing South African position and case law which determines the criteria for originality of a work. If we can prove substantial originality through the “sweat of the brow” test, this will create a strong nexus between the work and the human or juristic author.

In *Haupt v Brewers Marketing*¹⁵⁹ the element for originality was seen to be that the “author must have exerted sufficient and not just trivial degree of skill and labour in the creation of the work”.¹⁶⁰ The case of *Moneyweb v Media 24*¹⁶¹ took the requirement for originality further by stating that time and effort spent by the author will be a material factor which, however, must include more than “a mechanical, slavish copying of existing material”. Ultimately the Court refers to the author having applied his mind to the creation of the work.¹⁶²

While there has been no landmark case in South Africa in terms of works generated by artificial intelligence, there have been various cases applied to instances involving databases. In these instances, the courts were not opposed to extending the ambit of protection of copyright for databases, the main requirement herein being that significant labour should have been exuded by the author.¹⁶³

Taking into account the aforementioned principles applied in the South African context in determining whether there has been sufficient skill, effort and judgment exercised in a work to constitute ownership protection, I argue that one can establish a framework or test to be applied so as determine whether a sufficiently strong nexus exists between the human and the AI.

I assert that the following steps need to be analysed when determining copyright over an AI-

¹⁵⁹ *Haupt t/a Softcopy v Brewers Marketing Intelligence (Pty) Ltd* 2006 (4) SA 458 (SCA).

¹⁶⁰ 2006 (4) SA 458 (SCA).

¹⁶¹ *Moneyweb v Media 24* (31575/2013) [2016] ZAGPJHC 81.

¹⁶² (31575/2013) [2016] ZAGPJHC 81.

¹⁶³ (448/93) [1995] ZASCA 57; (3029/2017) [2017] ZAGPJHC 302 (15 February 2017); 1990 (2) SA 164 (D); (35769/2010) [2012] ZAGPPHC 65 (15 May 2012); (10/48519) [2014] ZAGPJHC 33.

generated work. Step one is the determination of the nature of the originality.¹⁶⁴ One needs to determine whether the work was AI assisted or AI generated.

Once this has been established, step two would be to determine the degree of human intervention.¹⁶⁵ If the work appears to be solely AI generated with hardly any human intervention, we need to proceed on the premise that copyright will not subsist in this work.

Should the work be a combination of human intervention and AI assistance/generation, a sufficient nexus needs to be established in proving authorship and originality. Generally, purely AI-assisted works or narrow AI would consist of a predictable result and could be argued to be a tool of the author.¹⁶⁶ In this instance copyright protection should be awarded.

In instances where AI generation has been employed and the result may be unforeseen or unpredicted, the entity wishing to enlist copyright protection should turn to the existing requirements as laid out in the current South African legislation. The entity needs to ensure that they can demonstrate not only that they have exerted sufficient labour, skill and effort into the work, but the requirement of the author having applied their mind to the work is significant in this instance.

If we follow precedent, entities could prove that although an AI-generated work may have reached an unforeseeable conclusion, should the entity have given the work and the output significant thought and applied their minds throughout the process, the work would then be protected. The example of the latest Rembrandt recreation comes to mind. Although the programmers and entities involved could not predict what the final image would look like, I believe that significant resources, time, energy and labour were instilled in the work and that the labourers so to speak applied their minds intensely to reaching the end result.

¹⁶⁴ McLaughlin (n 153) 20.

¹⁶⁵ McLaughlin (n 153).

¹⁶⁶ As above.

9. CHAPTER 9: CONCLUSION

In essence this mini-dissertation does not provide a conclusive element in all senses of the word. I believe that the topic surrounding this discussion and the mini-dissertation itself form more of a stepping stone towards a larger discussion. As set out above, we see that arguably there are two forms of predominant AI, namely, “weak” and “strong” AI. We further conclude that in most instances, the use of weaker AI will inevitably result in more human intervention in the creation of a work, thus providing a stronger nexus to the ownership status of the human workings behind the machines.¹⁶⁷

In the case of strong AI there is less to no human intervention,¹⁶⁸ thus in most intellectual property legal spheres resulting in no ownership rights to the human or corporation working behind the machine. We deduce this on the basis that with hardly any human intervention, the work will not seem to comply with the basic tenets of copyright law, being for one that the work must have been created by a human.¹⁶⁹ This is not only seen in the South African context but also in various global jurisdictions.

We can further deduce that there have been significant inroads in South Africa and the world at large with mass corporate investment in technological advancement.¹⁷⁰ Further to this, and specifically within the South African perspective, it is strikingly clear that the Copyright Amendment Bill has failed to form any clear or impactful position on artificial intelligence and its place in South African intellectual property law. Thus, the Copyright Act and the position it provides still stands. I conclude that as it stands, this position is significantly clear. Works seen to not have included the adequate level of human skill, effort and judgment invested in a work cannot be copyrightable.¹⁷¹

With so much invested in the realm of AI and technological advancement, should corporations experience instances where their ownership in these works is contested, we run the risk of progressive thinking and resources for technological advancement grinding to a halt.

¹⁶⁷ The ultimate pursuit of strong AI endeavours is to produce a type of “seed AI” that would be possible to exponentially increase its own intelligence by redesigning itself. McGinnis (n 30) 104.

¹⁶⁸ As above.

¹⁶⁹ s 2 Copyright Act (n 54).

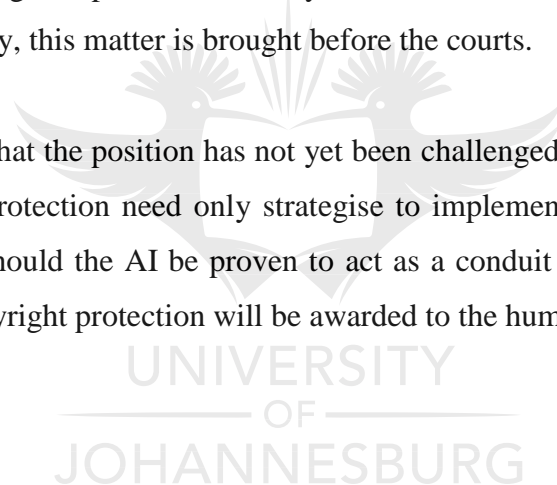
¹⁷⁰ Schoeman *et al* (n 150).

¹⁷¹ Copyright Act (n 54).

Although the position here is one where AI works under the current legal structure are not afforded protection rights, the mini-dissertation provides a form of corporate strategy for navigating this. Corporates wanting to ensure copyright protection need to strategise the use and incorporation of AI technologies. AI technologies should not be given *carte blanche* in projects but rather corporates or those wanting to be considered authors need to provide a breakdown of the skill, effort and judgment implemented¹⁷² in the work. This is mindful inclusion of AI into works, thus, not only being mindful of what AI advanced technology can do for the work, but also being mindful of the current laws to which this ever-expanding technology is expected to conform.

Although one may argue that AI works currently will have no protection should the human element be found wanting, the position will only be solidified once law makers make a clear call on this. Alternatively, this matter is brought before the courts.

Irrespective of the fact that the position has not yet been challenged, those creators or authors striving for copyright protection need only strategise to implement advanced technology in the work. Ultimately, should the AI be proven to act as a conduit for the finalisation of the work, I believe that copyright protection will be awarded to the human behind the machine.



¹⁷² McLaughlin (n 155) 20.

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