COPYRIGHT OF OBJECTS OF AUTOMATISED PRODUCTION

Maximilian Gartner

PhD Researcher, University of Bologna, Via Zamboni 33, 40126 Bologna BO, IT, maximilian.gartner2@unibo.it

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Abstract: *Machines are increasingly able to produce, to an extent independently, results that can be considered worthy of copyright protection. Such products are of substance that a third person without knowledge of provenance would likely attribute them to a human creator. This paper will explore the (contentious) attribution of copyright of such works under Austrian and German Law and will argue that if no other legal link can be established, it is ultimately the last interactor with the machine that should be awarded copyright under the current legal framework.*

1. Introduction

As a result of continuous progress in the area of computer science, new situations arise that can present difficulties when utilizing existing legal frameworks to assess them. This holds true for the field regulated by copyright. As of today, technology can create results that would warrant copyright protection both from an objective and a popular standpoint; this is true for all domains. In the field of music, algorithms that create music based on a particular musical style have been established with surprising success, such as DeepBach.[1] In the field of literature, automatized processes have created poems[2] or movie scripts[3], as well as short news or weather articles.[4] The inherent characteristics of the process of creating image files already requires distance between the human user of an imaging technology (e.g. camera) and the result. This is exacerbated by automatized processes such as automatic filtering or high-speed shooting and automatic picture selection without input of the human users.[5]

2. Copyright-Laws as a Human Centric Framework

The area of immaterial rights has started as a tool to protect the work of artists and other creators, based on what has been described by legal scholars as unexplainable inspirations within the brain and soul of a human, which are not accessible by «soulless» machines.[6] Difficulties therefore arise in the case of objects that *pro forma* rise to the standard of copyright protection but that have been created by utilisation of automated processes such as computer programs.

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1 Cf. Hadjeres/Pachet/Nielsen, DeepBach: a steerable Model for Bach Chorales Generation, arXiv: 1612.01010v2, 2017.

2 Cf. Bowman/Vilnis/Vinyals/Dai/Jozefowicz/Bengio, Generating Sentences from a Continuous Space, arXiv: :1511.06349v4, 2016.

3 Cf. Grba, Avoid setup: Insights and implications of generative cinema, Siggraph Proceedings, ACM, New York, 384–393, 2017.

4 Cf. Belz, Automatic Generation of Weather Forecast Texts Using Comprehensive Probabilistic Generation-Space Models, Natural Language Engineering (2008) 14/4, 431–455; Gong/Ren/Zhang, An automatic generation method of sports news based on knowledge rules, 16th International Conference on Computer and Information Science (ICIS), IEEE, New York, 2017, pp. 499–50.

5 Cf. Shacham/Reynders, Pixel Visual Core: image processing and machine learning on Pixel 2, available online at https://www.blog.google/products/pixel/pixel-visual-core-image-processing-and-machine-learning-pixel-2/ [accessed on 1 Dec 2019, 13:40].

6 Cf. Kucsko, § 1 UrhG in Kucsko/Handig (Eds.), urheber.recht2, Manz, Vienna, 2017 point 69, Wirtz, § 7 UrhG in Fromm/Nordemann (Eds.), UrhR12, Kohlhammer, Stuttgart, 2018 point 9.

Under Austrian and German[7] law, an object protected by copyright, i.e. a «creation», exhibits (*inter alia*) the following characteristics: (1) status as an intellectual/personal creation, and (2) idiosyncrasy. This entails, based on current understanding, that the physical object is not *per se* the protected entity, as the immaterial intellectual form and design of said object is the actual creation targeted by copyright law.[8] It follows that the classification of an object as a creation is a question of law to be solved on the basis of objective characteristics, independently of intent of its creator.[9]

2.1. Creation as a Human Process?

Currently, results of completely automatized processes are not considered to be protected by copyright law. However such sweeping statements risk to overlook that even completely automatized processes can be attributed to some sort of human input at a certain point in time. This transforms the formerly binary assessment into a more complex question of threshold.

2.1.1. Randomness

Copyright protection (usually) starts to apply at the earliest once an object is created «in the real world». The creation process links the object to its legal creator; this means every creation process must be linked to a natural person to establish copyright protection.[10] This link is stressed, once random elements are introduced into the creation process. Consideration on the topic of randomness is of usefulness for this subject because, similar to automatized processes, it deals with objects of which their creation process exhibits a certain remoteness from human interaction and intent. Similarly, creations originating of actions of other entities (such as animals) that cannot be attributed to humans such as animals can be analysed with the same strategy. Opinions on the validity of results of random occurrences as copyright-protected objects are somewhat divided, but results of completely randomly achieved results is usually considered not to be protected, while a «focused» use of randomness can by means of its selection already be a creative act.[11] Naturally, this approach does not give exacting guidelines as to what is still an acceptable level of randomness but creates a threshold problem.

2.1.2. Automatized Creation

Insofar the creation process of an object is done completely autonomous by machines (just as with animals), current scholars and jurisprudence argue that no copyright can be granted, because no human intellectual effort can be attributed to it.[12] If a process is of mixed character between human interaction and non-human processes outside of the immediate control, the effort conducted solely by the human must meet the threshold of idiosyncrasy, for example by selecting certain parameters of the otherwise uncontrolled process.[13] Some form of connection between an intellectual process within a human creator and the resulting object is

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7 While the German copyright act uses different language and structure, when comparing the two acts, the underlying rules as they are relevant to this discussion are similar. If not noted otherwise, the rules discussed herein can be considered effectively the same for both jurisdictions.

8 Cf. Kucsko, § 1 UrhG in Kucsko/Handig (Eds.),point 28 f; Schulze, §2 UrhG in Dreier/Schulze, UrhG[6] C.H. Beck, Munich, 2018, point 11.

9 Vgl. Appl, Urheberrecht in Wiebe Wettbewerbs- und Immaterialgüterrecht3, Facultas, Wien p.178.

10 Vgl Appl, Urheberrecht in Wiebe p. 181.

11 Cf. Bullinger, § 2 UrhG in Wandtke/Bullinger (Eds.), UrhR[5], C.H. Beck, München, points 15–18, Schoenebeck, Moderne Kunst und Urheberrecht, 2003, BWV, Berlin, p. 161; Schulze, §2 UrhG in Dreier/Schulze, point 8–10.

12 Cf. for Austria Kucsko, § 1 UrhG in Kucsko/Handig (Eds.) point 26; OGH 20.09.2011, 4 Ob 105/11 m, and for Germany Loewenheim, §2 UrhG, in Schricker/Loewenheim (Eds.), 2017, C.H. Beck, Munich, point 15; Nordemann, § 2 UrhG in Fromm/Nordemann (Eds.), UrhR[12], Kohlhammer, Stuttgart, 2018 point 184; LG München 21.03.1967, 7 O 154/66.

13 Cf. Loewenheim, §2 UrhG, in Schricker/Loewenheim (Eds.) point 13; Nordemann in Fromm/Nordemann (Eds.), point 21.

deemed to be necessary.[14] This is an important factor; as it requires a certain traceable link between the intent (representing here a vague intellectual process as opposed to specific predictive intent) of the creator and the characteristics of the resulting creation. This means consequentially, that in a mixed creation process, the following outcomes (presuming that the human input rises to the threshold of idiosyncrasy) are ultimately possible under this doctrine:

(1) Human input is mixed with non-human processes but no link between intent and result is established

(2) Human input is mixed with non-human processes and a link between intent and result is established

Under situation (1) the human creator acquires copyright, but merely based on his or her own input, i.e. copyright to the (immaterial) object supplied to automated process. The end result of the mixed process however remains inaccessible to copyright protection by the human creator. Situation (1) ultimately describes a blackbox scenario, in which human input might or might not be relevant to the result, but the result in itself is abstracted and disconnected from the human intent and its specific input. Under situation (2) the human acquires copyright to the resulting object at the end of the complete mixed process.

Again, like with the issue of randomness, a clear guidance is not given by judicial decisions or legal literature, so that the evaluation for a specific case cannot always be predicted accurately. In addition, the doctrine of requiring a link between intent and result is in contradiction to the overall systematic approach of applicable copyright laws. Indeed, the concrete result or its function is only of secondary nature in copyright law and is superseded by the creation process. This becomes especially visible when considering the legal treatment of independent creations of the same object, of which both are consequentially protected.[15] Applying aforementioned doctrine, by investigating a characteristic of the resulting creation, specifically its mirroring of human input, deviates from such process-centric analysis and creates unnecessary tension within the overall copyright framework.

2.2. Idiosyncrasy

Idiosyncrasy within the field of copyright law denominates a certain uniqueness of the object created, mere distinguishability however is not sufficient.[16] Idiosyncrasy is further expected to reflect the connection of the object created to its creator.[17]

3. Arguments for Expanded Copyright Protection

Recently, arguments have been brought forward to expand copyright protection to results of automated processes more expansively.[18] However, such recourse to pragmatism, while completely valid, is not necessary, as the wider application of copyright-law can be rooted in already existing court decisions (as well as the aforementioned intra-systemic interpretation approach in Section 2.1.2.

Jurisprudence and literature have discussed cases, in which the legal result is meant to deviate from the aforementioned principles. Considering the judgments in the following court cases, the underlying ideas can be expanded to encompass objects previously argued to be out of scope of copyright law.

[14] Cf. Ahlberg, § 2 UrhG in Ahlberg/Götting (Eds.), Urheberrecht, 2018, C.H. Beck, Munich § 2 points 54–56.
[15] Cf. Kucsko, § 1 UrhG in Kucsko/Handig (Eds.),point 38; Schulze, §2 UrhG in Dreier/Schulze, point 17.
[16] OGH 17.12.2002, 4 Ob 274/02 a; OGH 22.01.2008, 4 Ob 216/07 d.
[17] ErläutRV 1936 as stated in Dillenz, Materialien zum österreichischen Urheberrecht, 1986, Manz, Wien p. 43.
[18] Cf. Zankl, Künstliche Intelligenz und Immaterialgüterrecht bei Computerkunst, ecolex 3, 2019 p.244ff.

3.1. Creation Process as Antecedent to Actual Image Capture

In an Austrian court case, the Austrian Supreme Court had to decide about a case in which one party installed cameras on behalf of the other party. This raised questions to whom the resulting images might have been attributed to. While the main case concerned itself with neighbouring rights to copyright (note that images, under Austrian law, can be protected by a «neighbouring right» to copyright if it does not meet the (low) qualifications outlined in Section 2.), the court deliberated *obiter dictum* about the creation process of images in general.

The court found that for images, the artistic creation process can begin and end with the selection of the viewpoint and the settings of the device; before an actual timed trigger is activated and the object of interest is created.[19] This implies, human influence is exhausted after «setting the scene», and surrendering to factors outside of human controls. The court further affirmed legal theories put forward previously by legal scholars, outlining that «setting the scene» could be conducted via a human subordinate with no attribution to such subordinate despite the protected «creator» not having had any direct or physical influence on the result; the human assistant is thereby abstracted as a tool or aiding process.[20]

In the case and along the lines of the above, the Austrian Supreme Court found that the party that set up the camera, including selection of the camera location and the direction of view, but was uninvolved in the (automatic) triggering of the imaging process, was to be considered a (co-)creator. This is in conflict with the doctrine of maintaining a link between the creator's intent and the result, and/or that the contribution of the creator must in itself rise to the standards of copyright-protected works. As the trigger for the camera is either controlled by an automated process or potentially another party, the party setting up the camera has basically zero control over what will be depicted on the picture (for example based on weather or other occurrences).

This example can be generalized by imagining a simple scene: One person sets up a camera on a timed trigger to take a picture of a certain landscape, adjusting aperture and shutter speed to his or her needs. The following situation occurs: (1) The camera takes a picture of the landscape. This would be considered as sufficient to qualify for copyright protection. Now let us consider an alternative situation: (2) When the imaging process starts, a unforeseen object (e.g. animal, vehicle, other person) walks within the line of sight and completely fills the imaging circle. According to doctrine, given the unforeseen nature of the object, no characteristic of the resulting picture (i.e. not a single pixel or information quantum within the resulting work or its abstract representation) can be linked to any part of the intent of the person setting the camera. As a result, the picture would not be protected by copyright. This however would be in contradiction both to the court's finding above that the creation process can be finished before the imaging process even begins as well as the systemic purpose of the copyright laws, again putting supreme value on the creation process itself over any consequential result (see Section 2.1.2.).

Such actions can be equated with computer generated works e.g. random image generators, in which no human influence is possible after the initial «setting the scene». Under current consideration, such machines would not produce protected objects, given that there is no concrete link between the creator's intent and the characteristics of the resulting object. Nevertheless, comparison with aforementioned jurisdiction seems to be in stark contradiction of this doctrine.

[19] OGH 26.01.1999, 4 Ob 15/00 k.

[20] Platena, Das Lichtbild im Urheberrecht, Peter Lang, Frankfurt, 1998, p.198ff; Jacobs, Photographie und künstlerisches Schaffen, in Westermann/Rosener, Festschrift Quack, De Gruyter, Berlin, 1991, p.33ff.

3.2. Attribution of «Supernatural Input»

Multiple court cases have dealt with copyright issues connected to natural persons claiming that they have produced texts based on divine or supernatural intervention as a medium.[21] In these cases, the courts have regularly found, without disputing the veracity of medium-quality of the relevant persons, that the resulting objects should be attributed to the claimed medium.

The underlying issue in such cases is that the person claiming to be a medium states to have received certain input which it then wrote down as accurately as possible; a process that brings with it certain implications under copyright law. Indeed, in the infamous Austrian «Theobald»-case[22], a medium claimed that a book written by her was a «1:1»-identical mapping of the statements of a supernatural entity, with the exception only of different names used within the text as well as a prologue. Comparing such activity to an interaction between two humans, such as one person dictating text to another person acting as a scribe, copyright law would classify the first person as the creator; the act of mere copying or writing down the given text would not be sufficient to fulfil the requirement of «intellectual creation» of the object in question.

If taking the circumstances of input by a supernatural entity as factual, which the courts did (albeit without a doubt only because such situations are likely to evade proof by judicial reasoning), the medium acted only as a scribe copying the message conveyed by a supernatural entity. Taking these factual assumptions into account, any attribution of copyright and related laws to her are only consistent with the legal framework, if it is assumed that objects that rise to *pro forma* levels of creations but are not «created» in an intellectual sense by an entity that can be assigned copyright (i.e. a non-human) are assigned to the next potential copyright-holder in proximity of the creation process.[23]

Similarly, a text auto-generated by a machine would, under current doctrine, not be protected. Insofar the «medium» or user transcribes it without any creative additional input, protection would then, under the rules of these court decisions, be granted. This is systemically unnecessary (and in contradiction to the doctrinal link between intent and result) and yet another argument to extend copyright protection to the last interactor when applying the current legal regime.

4. Subject of Copyright Attribution *de lege ferenda*

This paper addresses the current situation of Austrian (and German) copyright law. It has highlighted the current consensus about objects created by an automated process, i.e. to deny copyright to people connected to the automated process, and how this is in contrast with the overall structure of copyright legislation and existing jurisdiction. It argues that to comply with the existing legal framework, objects created by an automated process need to be treated differently, and copyright protection should be granted. However, this must not be seen as an imperative for future regulation; merely as a pointer towards current inconsistency in applying existing law.

Copyright serves to protect and encourage the creation of objects it protects but strikes a balance with other public interests. Indeed, some scholars have suggested wide-ranging impact of the growing capacity of copyright law and an inhibitive effect on science.[24] However, even with a fixed capability of copyright law, its (negative) effects can be increasing if the underlying technology grows more powerful.

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21 OGH 20.01.2015, 4 Ob 259/14 p, OLG Frankfurt/Main 13.05.2013, 11 U 62/13.

22 OGH 20.01.2015, 4 Ob 259/14 p.

23 Indeed, the creation process might be understood in this case to be the writing of the text. However this collides with the idea that the creation process requires just a theoretical observability; in this case the input of a supernatural entity was clearly claimed to be observable by the medium. Alternatively, and analogously to the arguments with respect to images, it seems justified to accept that a creation process can be sufficiently concluded before the creation itself takes place.

24 Cf. Reichman/Okediji, When Copyright Law and Science Collide: Empowering Digitally Integrated Research Methods on a Global Scale, Minnesota Law Rev, 96-4, 2012, p.1362–1480.

For example, the « Library of Babel»-project is an endeavour to create every possible options of combinations of letters and characters in textual form for a given length.[25] At present, it claims to contain at least all potential combinations of 3200 characters, which would include all haikus and similar short literature work to ever be produced, as well as most academic abstracts or short computer code functions.[26] Assigning copyright to any person, such as the programmer as suggested by some[27], behind this project (or the person first accessing it) would basically nullify future copyright protection of all literature creations not exceeding this length. (The ultimate goal of the project is to calculate all combinations of up to 1,312,000 characters, which would include most likely every sort of literature ever to be produced by humans; for comparison this paper stays well under 20.000 characters.) On the other hand, such technology introduces awkward legal consequences: based on current law simply accessing the library and copying a distinct, never-before-seen work of literature will not trigger copyright protection, while a second person writing the same text by themselves at a later stage will be entitled to protection (a result similar to independent co-creation). A similar situation is rather unlikely to arise out of non-technology assisted human creative work. This example highlights an extreme case, but such edge cases will need to be considered when testing new ideas of adjusting copyright with respect to emerging technologies to create a consistent legal framework.

The following options can be considered, when re-regulating the copyright framework:

(1) Preservation of the current legal status[28]: No copyright protection is granted when utilizing automated processing and
   a. no traceable link to the creator's intent can be established, and/or[29]
   b. the creator's «own» contribution does not rise up to the level of protection itself («sufficient interaction»).

(2) Extension of copyright protection: Copyright protection (subject to other qualifications) is granted to
   a. the last person(s) interacting with / providing input to the process (or the person(s) instructing this person), and/or
   b. the person(s) with «adequate» interaction with or input to the process (where adequate interaction implies a level-state), and/or
   c. the creator(s) of the automated process.

(3) Extension of copyright protection: Copyright protection (subject to other qualifications) is granted to a non-human entity connected to or embodied by the automated process.[30]

How to regulate copyright in these situations is ultimately a legal-political decision, and as such outside of the scope of scientific inquiry. Nonetheless, this area will undoubtedly remain fiercely contested in the future, which gives reason to hope that a solid legal framework adapted to these emerging technologies will be introduced eventually.

[25] https://libraryofbabel.info/ [accessed on 4 December 2019].

[26] https://libraryofbabel.info/About [accessed on 4 December 2019].

[27] Cf. Zankl, Künstliche Intelligenz und Immaterialgüterrecht bei Computerkunst, ecolex 3, 2019 p.244ff.

[28] For this option, as shown above, certain legislative steps should be taken to enshrine or codify and thereby justify the existing legal inconsistency outlined above.

[29] Note that utilizing the «or» distinction is already expanding the current copyright protection scope.

[30] Cf. the controversial suggestion in Committee on Legal Affairs of the European Parliament, Report 2015/2103 (INL) 2017, in which it is suggested that special legal status for autonomous robots including certain rights and obligations should be considered.