EJLT European Journal of **Law and Technology**

Artificial Intelligence: A Creative Player in the Game of Copyright

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Abstract

Artificial intelligence (AI) may be understood in countless ways. However, it may be understood to be an entity sufficiently simulating the cognitive aspects of human thinking. As such, AI can make valuable outcomes which are able to meet the individual *conceptual features of copyrighted works* and to gain copyright protection. Based on that we could call AI an author of such works. Nevertheless, despite all the development around intellectual property, AI is not reflected enough. Copyright is still based on the ideas of previous centuries and persists on the criterion of a *natural person* as the author. Therefore, it is needed to analyse AI in this context, its creative options, place in the world of intellectual property law, and to shift the paradig*m of copyright towards the modern age, the age of AI.*

The paper focuses on a rudimentary metanalysis of AI and copyright in mutual interactions. In the beginning, the author's research is introduced with outlining all the intended proposed phases of regulation of AI within the copyright law and the methodology suitable for such a move. In the second chapter, AI definition and outcomes for the further operating are presented as well as its creative options which are rudimental for the assessment of the conceptual features. The third chapter deals with the copyright aspects of an AI itself focusing on an analysis of the applicable law on the national, supranational and international level. The fourth chapter represents the critical analysis and demarcation of the main problematic friction surfaces of copyright and earlier defined AI. The paper is concluded by an overall assessment of the analysis.

Keywords: artificial intelligence; author; copyright.

1 Artificial intelligence as a technological challenge to copyright

"The rise of the machines is here, but they do not come as conquerors, they come as creators" (Guadamuz 2017). In its essence, this statement of Andres Guadamuz reads how the age has changed under modern technologies' pressure. It is obvious that such technologies are making their presence known, at all possible levels, including law. One of the most touched areas of law is copyright where we can find more and more outcomes created with the help of artificial intelligence (AI) or by it. With the increasing share of an AI in the creative process, we shall seek the regulation of such phenomenon. The comprehensive regulation itself is not an easy step but

requires a lot of arrangements and preparatory materials as well as strict methodology and phasing with individual but logically connected phases.

The author is aware of such problems and he proposes the following structure of the regulation process. Before the final regulation, it is advisable to set and identify an applicable definition or model of an AI, for the research and regulation to be completely effective and transparent as well for defining a framework for the future work. Such a metanalysis of AI and copyright in mutual interactions then may serve for the descriptive-analytic study of the real state, where the theoretical background of defined AI and copyright could be proved or reversed. These two phases are crucial for the precise improvement and creation of a functional model of AI's regulation within copyright law. This third step of restructuring the copyright for the needs of AI shall be driven mostly as an experimental phase working with AI as an equal object or subject of legal relations and reflecting its options. In the final realization phase with de lege ferenda, the model itself could be presented based on the previous research and studying the problematics.

Appropriate choice of methodology is one of the key elements for the whole research and final legislation to be precise and sufficient (Smits 2012). It is one of the fundaments of transparent, provable and replicable research (Urbáníková, Smekal 2017, 26:4, p. 38-41; Elman, Kapiszewski 2017, 47:1, p. 43-47; Asendorpf et al. 2013, 27:2, p. 108-119). From the basic set of methodological approaches (Smits 2012) to the research itself, the descriptive-analytic-normative tryptic shall be the right move with the empiric part left aside. The descriptive and analytical part shall play the key-role at the beginning of the research (in the first and second phase) where AI and copyright must be analysed and described for other uses and mutual operability. A normative approach with the signs of experiment shall then continue with the setting of what the right regulation of AI, as well as the right approach of legislation and courts, should be. To operate normatively with the ideas of "new" state of law without proper metanalysis and description of the values could lead to a desirable purpose of the research but with obvious lapses in the proper handling of the problematics (Christiani 2016:219, p. 202). It can't be built on something not analysed, described and understood, not to mention the previously stated fundaments of research.

1.1 The metanalysis of AI and copyright in mutual interactions

This paper focuses on the first part of the process, on a metanalysis of AI and copyright in mutual interactions, because of the need of AI's definition and understanding for the following work to be acceptable and for the description and metanalysis to be fulfilled, as stated above. Therefore, the following is an analysis of AI and the basic regulation for the following studying and operating with an AI in the world of copyright which must be prepared for its growing influence. The paper is focused on presenting the options of AI and the possible ways of its understandings as well as on the possible creative aspects of an AI since the creativity is the fundamental aspect of copyright and could influence the authorship or assessment of the conceptual features within the outcomes of an AI. The paper tries to present another view and argumentation line for the presence of creativity within an AI based on some generally accepted definitions of this phenomenon and doctrinal understanding of the creative activity of an AI. The goal of the paper is to present the analysis and justification for understanding an AI to be creative as well as to outline the friction areas of an AI and the copyright. Since the copyright itself is built on the territoriality premise, the legal system used for reflection of the options of legal framework shall be the system of the Czech Republic.

The first part of the paper is focused on an AI *per se*. It shows the possible understandings of it from the moments of Turing test and its opponents, through the weak and strong AI division, to the creative aspects of an AI. In this part, it tries to point out that AI's outcomes could be found creative in the IP way of understanding and the AI could be found to be creative, based on the alteration of some accepted definitions in this area.

The next part is focused on the general regulatory framework of AI, which is nowadays still "unregulated" specifically, just as a part of another general process. Media, as well as plenaries of the expert public, are just emphasising the role of AI and its creative options, but neither the general legal framework nor the copyright framework is specifically built for it.

The third major part of the paper is trying to highlight the crucial friction areas of copyright and earlier defined AI, focusing on the outcome of an AI as a copyrighted work, AI as a possible author of such work, and the needs for making the special regime of AI's outcomes reflecting all the specifics of AI. In this part, the analysis of individual conceptual features of copyrighted works will be done as well as presentation of the main arguments for the authorship claims.

2. Artificial intelligence per se

2.1 Artificial intelligence: Part of a popular culture

An AI is continuously developing and its share in the area of potentially copyrightable outcomes is getting bigger and bigger. Furthermore, the production of its outcomes expands into a greater number of fields, from purely technological and industrial areas to areas of art inherently connected to copyright. In this understanding, there is no doubt that AI is operating as very well-functioning software, as mentioned below (Rushby 1998). Such production may then be divided according to a plethora of criteria, where all the groups may be represented by countless examples, of course. For the needs of this paper, let's focus on the examples from the area of art which stands for the main part of the copyrighted values. In this area, the creative options of an AI may manifest in its entirety. Here, we draw attention especially to the projects such as The Next Rembrandt, with AI creating a completely new look-a-like work of the Dutch maestro when comparing all his works, analysing his style, choice of colours and brush strokes and based on that developing the best matching and presumed portrait (Guadamuz 2017). Another project, which must be mentioned, is the British musical Beyond the Fence (Brown 2015). The systematics of creation is similar in most of the key aspects. AI was assigned – or operated – to compare the previously chosen artworks in form of musicals where the positive impact on the audience was proven. Based on that, it has analysed the "function parts" and modulated the best matching musical which had its premiere in February of 2016. The same principles were applied in case of Morgan trailer (Smith 2016). Lastly, we should mention the IntelLabs/Stanford project with the production of photos of non-existent places (Chen, Koltun 2017). With the whole picture divided into zones, a database of the street photos from dashboards of cars and a special algorithm, the AI was able to combine and modify them resulting in the photos of places almost unrecognisable from real-world photos.

These examples represented the understanding of an AI as specialised software, but from such understanding, it is needed to distinguish the AI operating as a "platform". Whether we are talking about the *DeepBeat**[2]* project, where the rap verses are created based on pre-set pairing algorithms (Malmi et al. 2017), the *DeepArt**[3]* platform operating with the photos or *HumTap**[4]* platform for creating songs sounding like the songs of any popular band. Regardless of how much

the creative process is dependent on some form of machine learning, unlike in the case of AI as specialised software, the role of *users* of such platforms is enhanced. The users are a viable part of the creative process and their uploaded data are fundamental for the form of final outcome. The users are the next subjects within the personnel substrate of the creative process and may play the key role in determining the authorship (see below).

Just considering the above-mentioned options and projects, some protection should be granted to the outcomes of an AI, and the right regulatory framework should be chosen to avoid undesirable consequences of non-existence of legislation (Lehman-Wilzig 1981, 13:6, p. 442-457), which could lead to mishandling such products and ad hoc solutions possibly not appropriate in the wider context. Of course, the public domain scheme could be applied in here, but such a solution could be undesirable.

But what is AI? What are the mechanisms of how it operates? It's hard to regulate something where we don't understand how it is operating. An important thing to realise is that AI can't be identified with pure objects used for creating other values. It is the very ability to operate creatively that distinguishes AI from a brush and other just tools. On the other hand, AI is not so independent and autonomous as humans and their cognitive thinking. Based on that, neither the regulatory framework suitable for general objects nor the framework determined for human creators can be deemed sufficient when operating with an AI within copyright law.

2.2 Artificial intelligence: The working definition

An AI is a complex and polysemic term. We can understand it as a field of informatics focusing on research of non-human intelligence and its cognitive aspects (Merriam-Webster; Luber 2011, p. 207). But this understanding is not suitable for the research and regulation itself because it is too broad and it doesn't represent the quality of the AI as an object/subject of law. On the other hand, AI may be understood as a tool, as an object basically helping people to understand the operations and cognitive aspects of the human brain (Luber 2011, p. 209). And this is the extent we must be operating in. But it would be too simple to just settle for such a definition. AI in this concept may be further subdivided, not only regarding the Turing test (Turing 1950:49, p. 433-460; Saygin, Cicekli, Akman 2000:10, p. 463-518) or argument of the Chinese room (Searle, 1980, 3:3, p. 417-457), as stated below. For the transparent and objective, as well as verifiable research and applicability of its results, we must state the divisions of AI, criteria for such division and these to address as fundaments for other work. We must find the baseline of AI for developing the regulatory extension.

There is a well-known Nilsson's definition of AI by Nils John Nilsson, a renowned expert on AI, which goes as follows:

"*AI is that activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment."* (Nilsson 2010, preface)

Such a definition is however too broad as well for the needs of the paper, as in the case of field of informatics, because it – among others – doesn't reflect its software character or its ability to create, and it is just one of the definitions of an AI as the field of activities to create something intelligent similarly to the definition of an AI as the field of informatics. More research is therefore needed for it to be caught up perfectly for the following study.

When talking about an AI and its extent (in the sense of ability to make some moves within or beyond the limits), some basic division is needed. The expert opinion generally recognises two

basic extents of an AI, the strong (full) AI and the weak (narrow) one. While the latter is defined through the constraints of the algorithm in which it may achieve remarkable results as an analytical and optimising tool (Negnevitsky 2005, pp. 56, 260), the strong AI shall be able - despite its own problematic definition - to move beyond such constraints (Preston, Bishop 2002). Such an extent is evident when discussing the Turing test. There are opinions expressing that this test can provide only an answer for the distinction of weak and strong AI on the one side and non-AI on the second side (for the problems of Turing test see Xu 2017). But why is it that we unite both the AI on one side? The answer lies with the Chinese room argument as a counterpart to the Turing test. In the case of weak AI, there is no doubt about the existence of the computer system when asking it a question. However, the Chinese room argument is questioning this thesis through the idea of the intelligent answer of non-thinking AI on the one side and intelligent answer of unable-to-think human on the other side. The experiment goes like this. Let's imagine a closed room filled with all the Chinese sentences which may exist and with two entities, an AI and a human. The human is theoretically able (based on a question in Chinese) to provide the answer only with the ability to search and orient in the text materials (without the need to understand what he is operating with). And it is the same in the case of AI. The argument tries to establish that the essence of the Turing test, the ability to respond meaningfully to the asked questions, isn't sufficient enough to demonstrate the ability to understand what the entity is answering or to be creative in the answer (Dennett 1991, p. 435). This argument is especially relevant in the case of copyright law when we realise the ability of humans to create works worthy of some copyright protection. There is no need for authors to create purposely, not to mention the possibility of minors or people limited in – or just without – legal capacity to be authors because the authorship itself doesn't matter to this status (Halpern, 2010).

A *strong AI*, contrary to the weak one, is different in the problematic aspect of the *black box paradox* (Star 1992, 5:4, p. 395-410). As such, it is objected to a plethora of debates on all kinds of levels (Black, William 2010). The main problem in here can consist in the degree of human control and knowledge of internal processes as well as with the idea of total singularity and self-awareness of AI (Ishida 2015:60, p. 1866). For the needs of this paper as well as the connected research let's leave this AI aside and move to the first type of AI.

In the case of the first one, the weak AI, there is no fear of not knowing where the AI could be operating. The constraints are well-defined. This type of AI is based on a finite number of algorithms and clear assumptions of their relations as well as the constraints (Sutton, Barto 2018, p. 37). The field of a weak AI may be further divided through a number of criteria. One of them could be the application, another their difficulty. The extent of weak AI is very broad but despite that, the individual examples (see above) have one thing in common, they are completely transparent for their authors in what they do and how they are operating. However, not all types of weak AI are the same in its functional process.

2.3 Creative options of an AI

When looking under the hood of the projects mentioned earlier and when talking about a creative ability of an AI, it is helpful to be inspired by the Newell, Shaw and Simon's view of computational creativity (Newell, Shaw, Simon 1958) while focusing on the assessment of the AI's outcomes, not the processes.[5] Moreover, with all the AI development, we can easily reject the ideas of immediate failure of copyright law or its inefficiency. There are these infinite monkey theorem (Borel 1913, 3:1, p. 189-196) or total library theory (Borges 2007) pointing to the ethereal randomness of the work on the continuity of time. Since they are operating without the

framework of time or probability and since creating the works within the models of these theories would be very time-consuming and almost impossible, we can exclude them from the analysis.

We can conclude that with modification of the fundaments of computational creativity, the AI's outcomes could be found creative in the IP way of understanding and the AI could be found to be creative. Generally, for an outcome to be creative, such an outcome must meet the criteria as follows (Newell, Shaw, Simon 1958):

- the outcome is novel and useful (for the individuals or the society),
- the outcome demands that we reject ideas we had previously accepted,
- the outcome results from intense motivation and persistence,
- the outcome comes from clarifying a problem that was originally vague.

Creativity in the case of an AI is abundantly debated. A well-known opponent to the creativity is Chaitin, who highlights the limited set of inputs as well as moves and functions resulting necessarily in a limited set of outputs, which must lead to the conclusion that the AI cannot be creative (Chaitin et al. 1970). What is needed to bear in mind is that this set of criteria is set for providing the creative (not pre-set) answer to the input question, generally speaking. In the case of copyright law, we must specify these criteria a little bit narrower while preserving their meaning on the one hand and preserving the ideas and role of copyright law on the other hand. When talking about granting the copyright protection to some outcomes, it is needed to analyse if such an outcome would meet the conceptual features of the copyrighted work (see below).

The *novelty and usefulness* are not the criteria of copyright law; they are the fundamental part of industrial rights. Regarding this criterion, it must be modified to the originality or uniqueness (based on the national legal systems or the system of the European Union, as stated below) for this criterion to be used within the copyright law. The *rejection of ideas we had previously accepted* is connected to the first criterion and even if the "value" of the outcome itself is not important for granting the copyright protection, the overcoming of the clinging to the existing values and ideas is important for not comparing the outcomes of an AI with the creations of humans. If such criterion would not be applied, no outcomes could be found copyrightable because they wouldn't fit into the broad options of humans. The criterion *resulting from intense motivation and persistence* then needs to be slightly modified as well because of the nature of copyright law. It really doesn't matter if the "work" is created intentionally or accidentally, in an organised or chaotic way (Clifford 2005, 82:2). While preserving the objective determination to be perceived as a "work" (see below), the dependence on the will and focus of the author on the final outcome would unjustifiably exclude a large number of creations from granting the copyright protection. This criterion needs to be understood more like the primary starting from the given values. The last criterion of *clarifying a problem that was originally vague* needs to be understood within the copyright law as enriching the cultural fund. Even if the "value" of the outcome is irrelevant, due to the creative activity as a fundamental element (see below), the protection is granted only to the outcomes enriching the *status quo* with its originality and creativity in nature. That leads to the motivation for the following creating. The problem may arise where it would be only a creative solution in the sense of the final outcome which wouldn't be original. The criterion would then need to be modified as the aspect of enrichment of the cultural fund to cover the wide spectrum of creations. Moreover, such modification would prevent the situations when two same outcomes would be created, because the cultural fund wouldn't be enriched in that sense.

Therefore, the *criteria for the outcomes to be creative* shall be understood within the copyright

law (for the more thorough analysis of conceptual features see below) more as follows:

- the outcome is original or unique (for the society),
- the outcome demands that we reject ideas we had previously accepted,
- the outcome results especially from intense motivation and persistence,
- the outcome comes from enriching the cultural fund.

The research of an AI and copyright in mutual interactions then need the systematic division for the reflection of individual categories' differences within the copyright law. Based on the similarities of creative AI and their fundamental principles of operating and creativity itself, and regardless of the main algorithm forming the basis of AI itself, we can distinguish two main groups.

Combinatorial AI. The first group of AI could be called just combinatorial because of the combination of already existing values. The algorithm just with the specialised calculations puts the values together in a pre-defined order and condition. There is a set space, possible combinations as well as relations. Individual approaches may also vary by the presence of unfamiliar objects in an otherwise familiar whole (Boden 1998, p. 354; Minsky 1960, p. 9; Russell, Norvig 2009, p. 610). An example of this group could be all the AIs with game-changing algorithms where the rules are applied in the right order and in the system how they are supposed to be applied. The example could be the project of *Beyond the Fence*.

Analogical or exploratory AI. Just as humans are led to behave analogically to the behavioural models accepted by society (Casinovi, Yang 1994, 13:11, p. 1391-1399), there is a special group of AI doing something similar. Analogical AI is based on a set of inputs and set of processes with the task to analyse (map, learn) how the inputs are correlated together, what is their structure and how the outputs are created (Holyoak, Thagard 1989). As a result of this, the general process framework is created which is then used for creating a completely new output correlating with the set of inputs. A typical example of this group of AIs is the already mentioned project of Next Rembrandt or the most of the platforms.

With the definition criteria mentioned above and with the distinguishing the main two categories, the question is the creative activity of an AI itself, especially when dealing with the creative freedom as stated by CJEU (see below). With the direct links among the individual steps of an algorithm (A à B)[6], the AI itself cannot be found creative, because of lack of the operability "freedom" of the software. This conclusion is then supported by the overall impossibility of the software to deal with anything undefined, whether the undefined values, data or processes (Dreyfus 1992; Polčák 2012). However, following Boden (1998) and the criteria of surprising and unexpected outcomes, we must distinguish such group of algorithms from two other and broader groups. Aside from the (i) group of outcomes of the strict commands, there could be recognised (ii) group of presumed outcomes and (iii) group of possible outcomes, while these groups are subsets to each other in this order.

While within the first group it is not possible to find the AI to be creative because the individual operations and instructions are executed only in the direct mutual link and there is no place for creative freedom, within the second and third group it could be possible to talk about a creative AI. The instructions are linked through the looser relations with the help of the multiplicity of answers under specific criteria (X => A à B ° Y => A à C), or through the AI operating with the semi-controlled element of chance (X => A à B° C), which leads to the appearance of creative freedom. Even if the framework is set and the possible steps and instructions are defined, it does not have to be clear to the author of an AI in what order or if such instructions would be executed. There is

the option of multiple answers for one instruction either based on some relevant criteria or the coincidence while the definitive multiple choice will be on the side of an AI, not the author or the user of an AI. In these cases, the final outcome may exist within the second (presumed) or the third (possible) group. Outside the third group, no outcome could be found (for the above-mentioned limitations), that's for sure, but within the third group itself the outcomes will be presented countless times, especially due to an existing complexity of an algorithm, which makes it impossible to its operator to determine what an outcome will look like. In this case, the above-mentioned criteria, as well as the creative freedom, may be met, which leads to the creative options of an AI. There is no doubt such relations can lead finally into moving of AI beyond the limits of presumed space where the originator may count with some possibilities but in case of chaining the algorithms the resulting combination of "choices" may lead somewhere else. But still, it can't move beyond the limits of pre-defined space. We may, therefore, find a creative activity in the case of given groups of an AI.

The element of chance is also a frequent criticism when talking about an AI. Often it is said that due to the coincidental creating of an outcome such outcome is not qualified to be copyrighted. But such an argument is unjustifiable because such coincidence is generally present within all the authors' efforts. Whether we are talking about the level of accidental spreading of brush bristles when painting, or about the level of art created intentionally with the implementation of an element of coincidence.

Therefore, we can conclude that an AI can be creative and its outcomes can be the result of creative activity as understood by copyright law, as it could be seen above.

3. Applicable law overview

Besides defining an AI, it is important to introduce the general regulatory framework of an AI within the Czech legal system. In the first part of this chapter, the general regulatory framework of AI is analysed. It is followed by the second part presenting the copyright peripeteia of an AI.

3.1 Regulatory framework of artificial intelligence

To regulate an uncertain phenomenon with no strict terminology and understanding (see above) is challenging. In the area of law, such a challenging effort is particularly significant considering basic fundaments of legal certainty and transparency. Despite all of that, regulatory efforts have occurred on various levels with individual goals. The important thing to point out is that up to this day no law in the Czech Republic is operating with the term "AI" and AI as such stays in this sense unregulated. However, there are some non-binding documents dealing with that. Before a description of the copyright framework, the description of the general framework on the Czech national, supra-national and adequate international level is stated.

In the Czech Republic (CR), AI itself is still just the object of academic debates with no reflection in the legal regulation. Media, as well as plenaries of the expert public, are emphasising the role of AI and its creative options, but there is just a small research base which could provide quality data for a legislator to make a special regulation. Mostly the regulation of partial aspects is influenced by the European Union (EU) which is described further in the text. Despite the fact there are voices alerting to the influence of AI, robotics and their role in industry, economy, business (Změnám na pracovním trhu pomůže umělá inteligence. Evropa zaostává 2018; Horáček 2017), the only semi-regulation material is the Industry 4.0 initiative report of Ministry of Industry and Trade, where AI is talked about only as a point of implementation to processes and possible problems in job

vacancies, its role as a discipline (sic!) in the Industry 4.0 is emphasised (Iniciativa průmysl 4.0, p. 48), and it is highlighting the needs of quality research for another study to be based on something (p. 60, 70, 74). Such research is led by some prestigious research and specialised centre (e.g. the Institute of Law and Technology[7], AI Center[8], Faculty of Mathematics and Physics[9] or Center for Innovations and Cyberlaw Research[10]). AI is obviously counted within the question of its impact on economics and industry (Umělá inteligence: Sektory a jejich potenciál 2018), but until AI has a strict and steady definition for the following regulation and application, we can only guess how the legislator will handle its onset. In December 2018, the study of research of the potential of an AI in the CR was created with the basic impact of an AI within the limits of the CR (Výzkum potenciálu rozvoje umělé inteligence v České republice 2018). However, this study is operating with an AI very broadly and doesn't really help with its understanding. On the other hand, it contains several recommendations like the report of growing AI industry in the UK (Hall, Pesenti 2017), which contains recommendations particularly in the data access area, supply of skills improvement and AI research (including intellectual property).

On the supra-national level represented by the EU, the regulation focuses on robotics much more than AI itself. Besides the European Civil Law Rules in Robotics (2016) talking about what general considerations and ethical problems must be dealt with and must be considered,[11] there is no special treatment and regulation for AI itself neither. Following that, in Opinion of the European Economic and Social Committee on Artificial intelligence (2016), the Committee highlights the problematic aspects of AI and all the opportunities and threats of AI with some basic division and points. EU in 2013 has set up the SPARC initiative in the cooperation with private companies and research organisations (EU Launches World's Largest Civilian Robotics Programme – 240,000 New Jobs Expected 2014), representing the policy effort to catch up the AI and robotics problematics (Making the Most of Robotics and Artificial Intelligence in Europe 2017). AI itself is however still unregulated even if the EU realises the strategical meaning of AI and urgency of well-timed regulation (The European Commission's Priorities 2018). In the recent Communication of Commission, Artificial Intelligence for Europe" (2018), there is an explicit emphasis on the competitive position of EU in the field of AI and appeal to an appropriate ethical and legal framework.

Finally, it is the very Industry 4.0 policy, which leads us to the international level. To regulate something unclear is impossible on the national levels, let alone the international level. Up to this date, there is neither any international treaty nor declaration dealing with AI itself nor the international initiative with the effort of unifying AI problematics, its unclear definition or regulation on the handling of AI. On the other hand, we must mention the Declaration on Cooperation on Artificial Intelligence (2018) signed by the member states of the European Union, which is only highlighting the roles of the states when cooperating in the AI development and research. These are just general and very various regulatory cushions which must be taken into consideration when talking about AI and its role in the field of copyright, although there is not so much. They provide only a basic framework and pre-emption for the copyright regulation of AI. As it could be seen, AI is still an unregulated phenomenon.

3.2 Copyright regulation as a specific part of the framework

Copyright regulation is currently as vague as the above-mentioned general framework. There is no stable and lasting definition which would be used by legal scholars in a mutual consensus. The next issue is persistent adherence to fundaments and principles of copyright by the 19th century with resistance to change (Aistars, Hartline, Schultz 2016, 23:4, p. 785). There are for sure some

reactions of copyright to modern technologies (like the implementation of software or database protection), but on the other hand, there are still a lot of aspects national legislation still take a stand on and don't want to overcome.[12] For the description, let's apply the reverse scheme and start from the international level to conclude in the area of national copyright systems.

The international level of copyright is short of AI in the question of its regulation. Individual treaties dealing with copyright and considered to be the copyright fundaments were signed in previous centuries when the expansion of AI was very minimal. Whether we are talking about Berne Convention (1886), TRIPS Agreement (1994) or WIPO Copyright Treaty (1996), none of them is dealing neither with AI per se nor the outcomes of an AI. If we accept an AI generally as software, then the TRIPS Agreement and WIPO Copyright Treaty are granting the protection to the software whatever the mode or form of their expression is (TRIPS Agreement, art. 10; WIPO Copyright Treaty, art. 4), even in the form of compilations of data or other material (TRIPS Agreement, art. 10 paras. 2). In the protection form, they are referring to the Berne Convention because the software is supposed to be protected as a literary work, even if the software itself is not such a literary work (art. 2).

In the case of the EU, even if there is not any unified copyright code, there is quite an extensive basis of copyright regulation. On the level of primary legislation, the treaties are dealing with the copyright only as the obligation for the EU to create an operational environment for copyright protection (Treaty on the Functioning of the European Union, art. 118, 207 and 262). The secondary legislation is dealing with the software in the directive area. The Computer Programs Directive[13] grants protection to software "if it is original in the sense that it is the author's own intellectual creation" (art. 1 para. 3). The sign of originality is very strong and is the fundament for the distinction of copyrightable and non-copyrightable software (Zibner 2017b, 8:15, p. 217-260). The copyright legislation is, however, not dealing with the situation of its outcomes as well as in the case of international treaties.

The national level of the Czech Republic is then influenced by the international treaties in the question of copyright as well as the EU's legislation. The main copyright framework is embodied in the Copyright Act[14]. This Copyright Act is based on the division of "classic" and "fictional" works (Sec. 2) with no special reflection of computer-generated works unlike in the UK (Copyright, Designs and Patents Act 1988, Art. 9 paras. 3). While the classic works are protected only when meeting very strict conditions as fundamental features for the work to be copyrighted (see below), fictional works (i.e. photos, software and databases) are not limited by such strict conditions and for granting protection to the feature of originality (following the EU) is enough. Despite this fact, mentioning of software outcomes is also missing. The main problem lies in s.5 of the Copyright Act. The Copyright Act itself is based on the traditional continental idea of objective authorship and the absolute ontological unity of the intellectual creation and the personality of its creator (Telec, Tůma 2007, p. 91). Such a creator may be only a natural person which is problematic when there is the role of AI (see below). In such case, an AI is totally excluded from the question of authorship and only the natural persons operating with it may be considered to be authors.

4. Friction area of artificial intelligence and copyright

If we have concluded above that AI is one of the most challenging questions in the current regulatory efforts, including copyright, and that AI itself is able to make creative outcomes and as itself, it can be found to be creative, we must mention what the crucial friction areas of copyright and earlier defined AI is. In the abovementioned cases the copyright issues may be divided into three logically connected levels: 1) outcome of an AI as a copyrighted work, 2) AI as an author of

such work, and 3) the special regime of AI's outcomes reflecting all the specifics of AI.

4.1 Outcome of an AI as a copyrighted work

An outcome of an AI as a "work" means to describe and assess meeting the conceptual features of copyrighted works. It depends on national legislation what the individual features are. EU is operating with originality in the sense of author's own intellectual creation, as stated above. National systems are then slightly moved. In the CR the conceptual features are as follows. The work shall be:[15]

"*a literary work or any other work of art or scientific work, which is a unique outcome of the creative activity of the author and is expressed in any objectively perceivable manner."* (Czech Copyright Code, sec. 2 para. 1)

The first conceptual feature, literary, artistic or scientific character depends on the nature of work and as such, it may be met. This feature is just a general classification based on the historical development and the traditional meaning of the individual categories (Telec, Tůma 2007, p. 15). The feature itself is not assessed in connection with the author who is totally irrelevant in this case.

The uniqueness represents a stricter imperative comparing to the EU standard and itself is harder to operate with due to vague interpretation of its meaning. Currently, the uniqueness is interpreted in its statistical meaning appealing to the individuality of existing creation. Even if there are different understandings in foreign legal systems (in Germany or Switzerland, it is understood as the reflection of individuality - See Dreier, Schulze, Specht 2015, p. 2017), in the Czech Republic that is not the case. This feature requires for the result to be – through the creative freedom (see below) – new in relation to already existing and at the same time unrepeatable in relation to pro futuro possibly existing works (Knap 1998, p. 34; Zibner 2017a). The uniqueness is supposed to eliminate the creations which are "not worthy" the protection comparing to the global system. It depends on an individual assessment of meeting this criterion. Concerning the options of abovementioned AI examples and concerning the form of already existing creations, we can say that this feature may be met. In case of photos as the outcomes of AI, it must be said, that in such case the originality criterion will be applied instead of a uniqueness. Originality (as mentioned above) is a much qualitatively lesser imperative and can be met much easier because of a lack of the statistical corrective. The problem in assessing this feature is that the ones obliged to interpret that have just a little idea of how to handle it.[16]

The next conceptual feature is the creative activity representing the distinctive creation and reflection of the author's personality in the sense of a unique combination of internal elements such as fantasy, talent, experience and others, which together are reflected in the author's contribution to his result and connect such work unmistakably with his author, which also influences the uniqueness (Chaloupková 2007, p. 4). This conceptual feature is (unlike the character of the creation) connected to the author. This conceptual feature states that within the creative freedom (C-145/10, Painer) the creativity of an author is expressed which leads to the elimination of only automatic or strictly limited expressions. In the case of outcomes of an AI, we can reasonably believe that this will be the specificity of the structure of the logically connected processes by which it is controlled, as stated above. Here it will depend on the breadth of freedom that the AI will have. But even if we would be able to prove the creativity within the AI, AI itself can't be currently recognised as an author due to the above-mentioned principles. It would be needed either to modify this principle or to look for another author within the personal structure

of the creative process, because such subjects may affect determining the authorship as well (see above).

The last feature, objectively perceivable manner is not needed to specifically explain. It is the result of a classic expression of the expanded doctrine of the idea-express dichotomy controlled by the idea of expressing the idea for its objective perception of the surroundings and the possibility of granting protection (Wood 2015).

Based on that we could summarise that the outcomes of an AI could meet the above-mentioned conceptual features and even the criterion of creativity which is primarily focused on inherent nature of human authors but could be understood as met when talking about an AI (see the analysis above). The only problem could lie within the authorship *per se*.

4.2 AI as an author of such work

The second step then is the question of *AI as an author of such work or outcome* determining the authorship in the case of AI's outcomes. Even if the conceptual features are met, due to the idea of the objective authorship, it is necessary to declare the outcome to be non-copyrighted work, or it is necessary to grant authorship to a natural person who has come into contact with AI at a certain stage of the creative process. There may be a problem again because of the plethora of people possibly operating with an AI. From the *authors of AI*, through the *users using an AI* (when talking about the platforms) to the *authors of the works used for "training" the AI.* Besides that, there is the option of no author of the work and *public domain*. In the CR, such a situation is possible only in the case of not meeting the conceptual features.

If the AI should be an author, besides the change of wording of the Czech copyright act it would be needed to grant an AI the legal personhood. Currently, AI itself can be the only object of the legal relations. For the moving to the subject area it must have the ability to be bearer of rights and obligations (Gindis, 2016, 12:3, p. 499-513; Kurki, Pietrzykowski 2017) as well as it is important to find the rational arguments for such granting (besides the authorship) and form of such legal personhood. But for such a move, an individual analysis is needed with finding the solution to all the questions raised regarding AI as the subject of legal relations.

If one of the persons participating in the creative process should be an author, it is problematic to choose which one. The current framework is limited only to natural persons able to be creative; within the creative process we may find three major groups of such subjects, 1) authors of an AI, 2) users using the AI and 3) authors of the works used for "training" the AI. We can state that the authors of an AI may be creative in the way of creating the AI itself, but it is doubtful, whether their creative activity is sufficiently focused on the individual outcomes of an AI as well as important enough to be considered in such an outcome (Ginsburg, Budiardjo 2018). The question of users is similarly problematic. Even if their creative activity may be focused on the individual outcome, the problem lies in the creative freedom of theirs and the settings of AI of how much space it is given to them to realise their creativity. The third group of authors of the works used for "training" the AI is important especially for creating an AI. Basically, where the users are allowed to operate with an AI, there has to be some framework or environment pre-created within which the users' data are modified. Such an environment is created based on scanning and analysing already existing sources (e.g. baroque paintings, renaissance music or The Beatles songs). Based on that, the general ideal model is created which allows users to modify their data into the final outcome of AI in the style of The Beatles or renaissance. The question is, what the creative contribution of these authors is. Even if they are so fundamental for the whole creative process,

their works can be (a simili to creating the classic work with no participation of an AI) considered being just external influences for the creativity (Knap 1986).

4.3 The special regime of AI's outcomes

Thirdly, what are – or supposed to be – the specifics of protection granted to an outcome created by AI? It is clear the current regime of copyright protection doesn't have to be sufficient considering the needs of authors as natural persons, lifetime duration and protection granted for some period of time after their death as well as financial compensation for their effort when creating the work. The question is what would be the right scheme to create and what would be the legal facts on which the legal processes would be dependent? Even if there would be a tendency to create a special regime of computer-generated works or some special category of works created by an AI, it will not be sufficient to build it only on the different subjects of copyright law while preserving the existing form of copyright when the phenomenon of an AI would be one of the key aspects of a new legislation.

Its characteristics need to be reflected while discussing the conceptual features of the copyrighted works because of its creative options (see above). The same goes for its position among the possible authorship claims where its role has to be considered with possible alteration of the participating users' importance (see above).

5. Conclusion and research baseline

The above-provided analysis brought information about the phenomenon of an AI with an emphasis on the area of copyright law. The provided understanding of an AI and its creative options was narrowed for the needs of the further research as well as for the needs of the copyright itself. After the introduction of the possible regulation analysis scheme, the paper tried to point out that AI itself could be found creative based on the character of outcomes reflecting the Boden's and Newell, Shaw and Simon's definitions. Based on that the copyright law needs to reflect the phenomenon of an AI and should expressly state what is the place of AI in the matters of potential authorship claims.

In the following chapter, the regulatory framework of AI was presented with the *status quo* of adequate legislation on international, supranational as well as the national level in the Czech Republic. This analysis has proven the efforts of AI regulation which are still not expressively reflected but with the immense potential, especially considering the regulation of individual questions connected with AI and its software nature.

The last chapter then presented the main problematic copyright questions of AI outcomes within the current legislation setting with a focus on the law of CR, it outlined necessary arising questions and tried to provide possible answers to them while pointing out the need for a copyright regulation shift toward the AI. In this chapter, the copyright issues have been divided into three logically connected levels: 1) outcome of an AI as a copyrighted work, 2) AI as an author of such work, and 3) the special regime of AI's outcomes reflecting all the specifics of AI. It was shown that the outcomes of an AI may meet the conceptual features, that the role of an AI within the authorship claims is still the unclear situation with a few possible solutions and that to prepare the right regime for the outcomes needs to be done while reflecting the special characteristics of this phenomenon.

If we want to cover all the questions in this area, other continual research shall be needed in all the individual tasks. Individual research conclusions then may result in creating a new functional model of copyright operating with AI as an equal subject in legal relations.

Acknowledgement

Hereby I would like to thank especially to my supervisor *Matěj Myška* from the Institute of Law and Technology for the critical review and feedback when writing this paper, and to *Abbe Brown* for her unceasing help during the editing process. Special thanks go to the reviewers for their help and feedback as well.

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[2] Available from: http://deepbeat.org/

[3] Available from: https://deepart.io/

[4] Available from: https://humtap.com/

[5] Basically, when the framework is built (whether in the area of law, politics or sociology), there are two general ways of how such framework can be built, either with focusing on the outcomes while reflecting the process to some extent (e.g. securing its transparency), or with focusing on the process itself while reflecting the outcomes to some extent (e.g. securing the creative benefit).

[6] With the classical meaning of the mathematical and logical operators.

[7] Official website available from: http://uptprfmu.weebly.com/

[8] Official website available from: http://aic.fel.cvut.cz/

[9] Official website available from: https://www.mff.cuni.cz/to.en/

[10] Official website available from: https://www.ilaw.cas.cz/vyzkum/cicero.html

[11] See especially *Matters of consciousness and the role of Asimov's Laws in robotics* (European Civil Law Rules in Robotics 2016, p. 12), *Protecting human liberty in the face of robots* (p. 22), where the role of humanity is emphasised as well as Asimov's laws which must be prioritised till the AI „*become or are made self-aware"*.

[12] This is the case of the Czech Republic where the copyright act and the copyright system as a whole were created at the turn of the century and are based on the principles, ideas and structure of previous copyright acts with the long-time doctrine.

[13] Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 On the Legal Protection of Computer Programs; this directive is following the Council Directive 91/250/EEC of 14 May 1991 On the Legal Protection of Computer Programs.

[14] Act No. 121/2000 on Copyright and Rights Related to Copyright and on Amendment to Certain Acts (the Copyright Act), as amended.

[15] We are focusing on the conceptual features of classic works, not the fictional ones, because of the outcomes' literary and/or artistic character.

[16] In the Czech Republic there is infamous case Svěrák v. Bauhaus, file no. 30 Cdo 60/2011, where the court instead of its own interpretation of uniqueness copied the parts of commentary literature.