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LEGAL FRAMEWORK OF COPYRIGHTS IN RELATION TO THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE

Master's thesis
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ABSTRACT

The research was carried out to discover if there exists a need to alter the existing copyright legislation because of the rise of artificial intelligence. Currently only a human can be an author. That is why this is a research of if it could be changed in the future, or if it would be possible to create a legal vicarious effect between AI and the owner of that technology, to better facilitate works that are created by AI. The issue is international, and because of that there is a comparison between EU and US approaches to authorship, copyright and AI, to find out similarities and differences, if those would enable legal co-operation, or if it would prove out to be an impossibility in the current moment. The methods used in the study are qualitative and comparative legal research, based on scientific journal articles and books published by legal scholars. The main results and conclusions that the study draws are, that there exists a need to adapt the existing copyright legislation to facilitate computer generated works in the future, and computers ought to be granted a special type of legal authorship. Co-operation in the field of authorship by artificial intelligence between European Union and United States is possible but not likely, and there are several potential ways of assigning liability over computer generated works, out of which the author sees as the most potential one being using the principles of vicarious liability.

Keywords: Copyright, Artificial Intelligence, Computer Generated Works, Authorship

INTRODUCTION

Digitalization is, as well as everyday electronics are technologically advancing and improving faster than ever before in the history of the human kind, and thus it is relevant to find out how the existing legal framework in the field of copyright is adapting to artificial intelligence getting even more intelligent than it is today. The technology is slowly stepping into everyone's pockets in the form of smartphones and other devices, and that creates the research problem that is, can the existing legislation keep up to the pace of the technological advancement, or should we start considering ways to improve the copyright legislation we have in order to facilitate for the technological change in tomorrow's society? For this reason this thesis will be a study on the topic of artificial intelligence and computer generated works in relation to copyright and authorship in the existing legal framework.

There is an ongoing race on who can create, develop and innovate the most advanced and best functioning solutions in applying artificial intelligence in computer related systems. -Based on that, the author of this thesis finds, that a comparative legal research between United States and the European Union legal frameworks on copyright and authorship regarding computer generated works, would be an issue of relevance, when it comes to researching the legal regulation of the position of artificial intelligence as author, and the potentially existing legal conflicts, divergences and convergences in the regulations of the two geographical and legal areas. There is a need to find out what are the similarities and differences in the facilitation of artificial intelligence as author in copyright laws in the European Union and in United States, and through this study it is possible to map potential future opportunities in terms of artificially intelligent author, copyright, liability and potential co-operation in the regulatory field on the subject matter.

As artificial intelligence acquired through machine learning achieves the capability to produce works that would in the current situation theoretically make it possible to understand it as the first hand author, according to the definition of authorship that we have today: by creating original works that are in objective or tangible form, and that can be perceived and reproduced, obviously apart from being a natural person, what would be the legal rights and liabilities of the machine and the machine operators, as when it comes to the ”author”, as we are not currently talking about a natural or a legal person?

Based on the above presented reasoning and introduction to the topic, below there may be found the three research questions and their three hypotheses around which the thesis is being constructed.

The first research question is, if we would need to adapt our existing copyright legislation to facilitate these technological advancements better and more specifically, what is the impact of machines being the author *vis á vis* the current requirement of human being as an author of the copyrighted work? The hypothesis for the first research question is that, yes, the existing copyright legislation's requirements will need to adapt in order to facilitate computer generated works better, and granting machines authorship would mainly have a positive impact in securing economic rights related to copyright. However, as the issue is going to be studied further, there exists a possibility to find, that perhaps our existing legislation might be functional also in the future in administrating the matter.

The second research question: How could those similarities and differences between European Union and United States copyright legislation regarding author and computer generated works be merged into an internationally unified or co-operative approach towards the legal issue of computer generated works? The second hypothesis is, that: Yes, it is possible to reach a regulatory agreement between the EU and US, on the topic of authorship of computer generated works, as currently there exists something that could be described as a legal void in the field, and all the existing legislation is based on an earlier and different stage of technological advancement, which in itself helps the creation of shared regulation when both parties can start from a clean table with the subject matter being regulated.

Third research question: In which manner could we create a legal vicarious effect between artificial intelligence and the natural or legal person functioning as its operator or owner, by using the existing legal framework? The third hypothesis is, that by researching the existing legal framework it is possible to present legal options for formatting future draft legislation about the rights and liabilities of natural and legal persons overseeing machine authorship, and thus computer generated works, in order to present viable options for practical legal solutions for creating an indirect liability between legal or natural persons and artificial intelligence that is creating works.

Based on the academic legal literature, the aim of the thesis is to give options and tools on how to proceed with developing the existing copyright legislation into a more modern version of its current

self, in order to facilitate smoothly the new way of creation of works into a functional part of the legal framework of the future. The contribution to the legal academic field that this thesis makes, is a comparative analysis between United States and European Union on the topic of potential changes required in the future for the copyright legislation, in order to facilitate computer generated works better, as the number of those works will only rise in the future. This is why conducting a legal research on a wide range of legal scholar's opinions and views in the field is important, in order to reach a concise understanding of what is happening, and how are we able to prepare ourselves for the slow change going on around us.

The methods to be used in this Master's thesis will be mostly qualitative, basing the research on the comparative study of academic legal journal articles and books written by several different legal scholars, and analyzing the views of the scholars on the topic in order to reach a conclusion. Also in the last chapter of the thesis an interview of a copyright expert has been conducted for the purpose of understanding potential future developments of the issue.

In the first chapter it is only logical to go through definitions of the concepts that will be discussed in a vast extent in the research, the elements that form the core of this research. This is in order to clarify the topics that will be the essence of this thesis, that do not necessarily yet have a clear and concise legal definition provided in the legislation, and thus, due to the nature of the topic in the middle ground of law and technology, it is required to create this understanding of the core concepts by combining technological knowledge and practical legal usage of those terms and concepts in order to achieve an understandable bigger picture of what is going on.

In the second chapter the legal relevance of these developments will be opened up more in depth. Naturally, as mentioned practically in the first paragraph of this introduction, the topic is relevant and current, as technology is taking very fast and long leaps to the future all the time, and we need to keep up with it, by potentially adapting our legislation or legal culture, but we as a society are already so far with the fast paced developments of technology, that the legal field cannot ignore the topic completely and hope that this trend will merely disappear as the general public loses interest created by the novelty and the sense of science fiction of the topic. For this reason, the second chapter is reserved for explaining why we as lawyers should be especially interested in this topic, and also the second chapter is going to introduce how this topic has already been handled in the written legislation, potentially existing international agreements and in the everyday life of the courts.

The third chapter's first half is reserved for the academic writer's views and opinions and explanations on why they favor the currently existing legislation to be changed in order to adapt better to the changes that the technology has created. The third chapter's second half, has a similar approach, but for balance in that chapter there are going to be presented academic scholars' opinions that are not favorable for adapting the legislation in order to successfully handle and facilitate the advancement of artificial intelligence in regards of copyright legislation. This type of division is created in order to show the both sides of the coin. There always exists two types of opinions on any given topic, and I believe that for an objective research there is a need to objectively research both types of arguments without favoring one side or the other during the research, regardless of the pre-supposition the author has, that is also known as a hypothesis. This type of research gives us a wider angle to the topic and better tools for reaching a conclusion, as most things are rather a large gray scale than clear selection of black or white, so most things are not usually purely good or purely bad, and thus through having the full scale of grey on the topic, so further on in the research based on this information, we are going to be able to reach an informed conclusion that has been balanced on the negative and positive aspects relating to it.

In the fourth chapter the applicable case law will be discussed. Due to the freshness of the area of legal research, the amount of caselaw is going to be limited to the most important cases, but also at the same time, the reader will gain a good overview on how the courts apply the existing law over related cases, when it comes to questions of authorship, control and applicability of the existing copyright legislation on the topics of computer generated works, enabled by the developing Artificial Intelligence. As might be expected, from the cases that will be presented, we are going to look for patterns of court rulings that might give us hints of the general opinions of the given amount of judges, which in itself could give an indication of the existing legal culture, but we are also going to look for clues from the cases, if there exists difficulties in applying the existing copyright legislation to computer generated or other non-human author created works, because this type of analysis will bring us closer to the conclusion of potentially needing to change the definition of authorship in the existing copyright legislation.

The fifth chapter will bite into the issue of European Union and United States similarities and differences in the field of legislation, case law and legal culture when it comes to the authorship question of the copyright protectable works. The research is aiming to find how much or little the two schools of thought are separate of each other, or could they actually be just one shared school of

thought? Also before having fully researched the issue, there also exists a possibility, that there exists so few legally relevant material of the topic on either side, that it might be impossible to even describe either of the approaches as a ”school of thought”. In case there is either a legislative void, or the approaches to authorship, copyright and computer generated works are relatively similar between the areas, that could open up a potential option for international co-operation in the form of unified regulatory approach in the field of computer generated works, authorship and copyright.

Chapter number six is given for a relatively brief speculation of future opportunities in the field of copyright, authorship and computer generated works and development of artificial intelligence based on the research conducted in the previous chapters, in order to gain a view of how the future could theoretically look like, if any of the suggested legal approaches would be followed. Also for the last chapter the author of this thesis reached a representative from a Finnish copyright organization who was kind enough to share their personal views on the potential future developments of copyright in relation to Artificial Intelligence based on their professional experience.

And finally as the last chapter there is the conclusion, in which the whole research will be wrapped up and the solutions presented, the research questions will be concisely answered, and the hypotheses from this introduction will be formally either deemed as true or false, and explained what was it that came up in the research that proved the solution to be one or the other. Also if it happens that it will turn out that a hypothesis could not be proven to be either true or false due to the vast gray scale of life and legislation, instead of being a yes or a no, being something more of a ”maybe” or ”possibility that does not necessarily need to happen” those occurrences will be explained in detail in the conclusion as well.

1. DEFINITIONS

Locating the liability in the case of an autonomically functioning machine is a difficult question. We have the current system, where the blame falls on the manufacturer, as the money is located there. However, if we would have an occurrence of damage caused by computer generated work, who would be liable? The manufacturer? The computer? The programmer? The user? In this thesis the aim is to make an attempt in locating the authorship of the computer generated work, as well as look for potential options for solving the liability issue. In order to do this, it is necessary to go through some definitions of the topics and phenomena the thesis is handling.

1.1 Copyright

Copyright is one of the rights that turns something intangible into something that one can own as property, as Sir William Blackstone brilliantly put it in 1825 in his Commentaries on the Laws of England: ”There is nothing which so generally strikes the imagination, and engages the affections of mankind, as the right to property; or that sole and despotic dominion which one man claims and exercises over external things of the worlds, in total exclusion of the right of any other individual in the universe.”[1]

Copyright has been defined in several international conventions, and several further aspects of copyright have been regulated on. The most significant copyright treaties are TRIPS[2] (Trade Related aspects of Intellectual Property) and Berne Convention.

To acquire copyright protection for the work, the work needs to be an original creation of the author. Ideas cannot be protected by copyright, only the expression of those ideas that can be perceived with human senses. In the European Union, copyright protection applies immediately after the creation of the work, and there is no need to separately register the work. According to Zemer, the modern copyright which is nowadays treated very much like the more traditional types of property, such as real estate to name an example, and it originates from the English law of author’s.[3]

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[1] Blackstone, W., (1825) *Commentaries on the Laws of England*, 16th Edition, book 2, chapter 1, London, Butterworth and son

[2] World Trade Organization 01.01.1995 Agreement of Trade Related Aspects of Intellectual Property

[3] Zemer, L., (2006) What Copyright Is: Time to Remember the Basics - *Buffalo Intellectual Property Law Journal* vol. 54 p.56

According to the Berne Convention it is possible to protect the following works under copyright legislation: literary works; advertisements, maps and technical drawings; films, musical compositions, and choreography; as well as artistic works, such as paintings, drawings, photographs, sculptures and architecture.[4]

Rome Convention[5] from 1961 protects the rights of performers, producers of phonograms and broadcasting organizations. Beijing Treaty[6] from 2012 deals with audiovisual performances, and the four core economic rights involved with those performances; right of reproduction, right of distribution, right of rental and the right of making the work available. Beijing Treaty also grants moral rights to the performers. WIPO Copyright Treaty[7] (WCT) from 1996 is an agreement under Berne Convention, that is aimed to protect the rights of the authors in the digital era and on the digital playing field. The treaty establishes that computer programs and compilations of data or other material, that are usually just called ”databases” shall be protected under copyright legislation. Additionally WIPO Copyright Treaty handles certain economic rights in the digital world.

The term copyright is usually used to describe the original artistic and literary works of the person who is the author of the work, and the term ”related rights” exists to describe the rights of performers, phonogram producers, broadcasters and other persons who disseminate author’s works, as explained by Sterling.[8] Copyright is a wider term to describe a bundle of rights that are involved with an author creating original works, and the term copyright can be divided into two subcategories; economic rights and moral rights.

Economic right means essentially the right to make money with the work that has been created, economic rights include rights of making the work available for the public, the right of distribution, right of reproduction; meaning the right to make copies of the work, right to perform the work; e.g. right to perform a song in public, right to license the work, right of renting and lending copies of the work, right to broadcast the work to the public, and the right to make adaptations and derivatives of

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[4] Berne Convention of 1886, latest amendment in 1979, http://www.wipo.int/treaties/en/text.jsp?file_id=283698

[5] Rome Convention, 1961 http://www.wipo.int/wipolex/en/treaties/text.jsp?file_id=289795

[6] Beijing Treaty, 2012 http://www.wipo.int/wipolex/en/treaties/text.jsp?file_id=295838

[7] WIPO Copyright Treaty (WCT), 1996 http://www.wipo.int/wipolex/en/treaties/text.jsp?file_id=295157

[8] Sterling J.,A., L., (2000) Philosophical and legal challenges in the context of copyright and digital technology - *IIC; International Review of Industrial property and Copyright Law 31(5)* p.508

the work (eg., making a film out of a novel, or translating a novel). Economic rights can be waived completely by using creative commons license, or the rights to the work can be sold to another party, or optionally it is possible to license the rights of the work, when the user needs to pay royalties for using the work.

Moral rights have to do with the moral and emotional aspect of the created work. As Zemer puts it in his article, moral rights protect the integrity of the work and the author's connection with it.[9] In the European Union, under the existing jurisdiction it is not possible to assign or waive the moral rights of the created work. Moral rights include: right to claim authorship; being named as the author of the work, right to keep the work private by never making it accessible for the public,[10] ;right to forbid distortion, modifications or mutilation of the created work that would be prejudicial of the author's honor or reputation, and the right to reproduce the work in any form before it is being destroyed; for example if a statue is going to be destroyed, the author has the right to photograph it before the destruction. Interestingly enough, if the work is destroyed, for example in a fire, the author's moral rights to the work seize to exist, at the same time as the work seizes to exist.

Berne Convention for Literary and Artistic Works was created in the aftermath of the Paris "Universal Exhibition" instigated by author Victor Hugo and hosted by the French government. It is undeniable, that the moral right in copyrights has a strong European origin.[11]

Copyright can be also considered from the point of view of how strong the protection is, being either something that ought to be either more limited or more expansive, depending on whose opinion is being inquired. As Hietanen describes the issue, the more expansive approach to copyright protection and the rights given by copyright ownership could be described as maximalist, as the logic behind giving a very strong copyright protection both in terms of economic and moral rights, would incentivize the creators of creative works to create more, and thus the strong, so called maximalist protection of those rights would benefit the society as a whole.[12] However, it could also be argued, that if the protection of those rights is too excessive, it might be difficult to utilize the

[9] Zemer (2006) *supra nota 2* p.64

[10] Zemer (2006) *supra nota 2* p.63

[11] Palahniuk, Hugo, Malraux, Bakunin, and others (2016) *supra nota* 16, p. 269

[12] Hietanen H., (2008) *The Pursuit of Efficient Copyright Licensing - How some rights reserved attempts to solve the problems of all rights reserved*, Lappeenranta, Lappeenranta University of Technology Digipaino, p. 11

works that have been created, as there would be too many regulatory tangles on the way of reasonable legal usage of the copyright protected material.

The exclusive right that copyright protection gives the author, is more limited than traditional property rights. As Zemer furthermore describes, ideas cannot be protected, but the expression of the ideas can be protected.[13] And that is why in the world there exists practically an endless amount of photographs, drawings, paintings, sculptures and many other forms of expression of a banana. They are protected, because of their original expression, not because of the general idea of making a banana visually perceivable. Additionally it ought to be noted, that with the same logic as described by Holzmann in relation to patents,[14] copyright protection in itself merely means the right of excluding others from using your rights, but if the work itself would not fall under the scope of thing that would be acceptable to use, the author would not have the right to use the work either.

A good example of a situation where an author of the copyright protected work would not be allowed to use any of the rights of exclusion that are related to their work, such as first publication, or the right of distribution and others, would be a Finnish case from 2008 of artist Ulla Karttunen and a an art exhibition with a collection of her works, exhibition being called Neitsythuorakirkko ”Virgin whore church”. In the case the artist had created works of child porn by downloading material online and making some artistic adjustments on the pictures, in order to criticize child porn that is available online, but the art exhibition was taken down by the authorities, and the artist received a judgement from Helsinki District Court for the possession and distribution of child pornography instead.[15] So even copyright is not absolute or automatic in the sense that it could not be ignored, as in some cases it is also possible that even the author of the work does not have any rights to their own work based on other legal provisions for the purposes of general public benefit.

Dreier considers that copyrights on computer programs and paintings are not comparable, and that the more a machine is used in creating the work, the less the work actually represents the author’s own personal original perception of the world. He has two suggestions for the future from the point of view of the French *droit d’auteur* to accommodate potential and likely future implications:

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[13] Zemer (2006) *supra nota 2* p.60

[14] Holzmann, R.T., (1995) *Infringement of the United States Patent Right - A Guide for Executives and Attorneys* - USA, Quorum Books, p. 12

[15] Rytsä, P., *Lapsipornoteoksen takavarikko (Detainment of a work of child porn),* YLE (Finnish National Broadcasting Company)14.03.2008 yle.fi/aihe/artikkeli/2008/03/14/lapsipornoteoksen-takavarikko 15.03.2019

1. ” First, the more technical the resulting digital work is in character, and the more a machine is used in the creation of the work, the less will the final outcome reflect or even prolong the creator's personality.”[16]
2. ”The more there are works being created, stored and accessible in digital form, the more the new works draw upon the pre-existing material.”[17]

However, it could be argued that all developments of the culture that the humanity has created are in one way or another based on the works of the previous generations, so with this logic presented by Dreier, if someone painted into a wall of a cave at the dawn of time it would be more worthy of a copyright protection than it would be if someone would paint a painting today, which to the author of this thesis seems somewhat incoherent. The argument presented by Dreier on the nature of copyright and authorship is inarguably a tempting one, but at the same time it overly simplifies the matter of authorship and copyright protection, that in its current form is not in practice in the European Union really all that linked to any type of inherent artistic value of the work.

Entertainingly enough, acquiring copyright protection has been described with the following words in Dr. Dreming Liu’s published article: ”It is commonly accepted that originality does not require merit, quality, novelty, usefulness or uniqueness. … As Mummery L.J. puts it: … A work may be completely rubbish and utterly worthless, but copyright protection may be available for it.”[18] United States Office of Technology Assessment Congressional Board agrees with the statement at least on the level of principle, though with slightly milder wording, of ”originality does not mean novelty.”[19]

Additionally something worth of noticing is the quotation from Dr. Dreming Liu, presented above, about the fact that there does not exist a need for the object of copyright to hold any artistic or inherent value, even when created by natural person authors, as added by the author of this thesis. This question of inherent value and the lack of it often tends to be forgotten when discussing the possibilities of adapted and novel definitions for copyright protection of computer generated works.

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[16] Dreier (1995) *supra nota* 14, p. 996

[17] Dreier (1995) *supra nota* 14, p. 997

[18] Liu, D., (2014) Of originality: originality in English copyright law: past and present - *European Intellectual Property Review vol. 36(6*), p.377

[19] *Finding a Balance - Computer Software, Intellectual Property and the Challenge of Technological change* (1992) Washington D.C. Office of Technology Assessment Congressional Board of the 102d Congress, US. Government Printing Office, p. 174

The reason the definition of copyright is such a relevant one when it comes to analyzing if the current copyright legislation ought to be adapted in the future in order to facilitate computer generated works and the liability issues related with those better, is, that how well something can be protected by copyright is on a very essential level linked to what copyright is considered to be and to entail.

So, as can be noticed from the above described definitions of copyright: The definition of copyright, just as the definition of anything else, varies slightly from a legal source to another. This type of variation between definitions, no matter how slight, gives room for interpretation, and interpretation gives room for future developments of legal culture.

1.1.1. Authorship

Authorship is in the core of the definition of copyright and in the possibility of acquiring that right. In order for a copyright to exist, there needs to be someone or something to create a work that can be legally protected. Authorship is a way of assigning a copyright to its owner, but also ownership and decision making are ways of assigning liability over the decisions that have been taken, so this is why assigning authorship is of such importance when considering the future of copyright and computer generated works and also assigning liability on decisions made by artificially intelligent software.

Currently the consensus is, that the creator of a work needs to be someone, and not something. However, from the point of view of this thesis, it is of utmost importance to study the case law and academic arguments of authorship not being limited only to natural persons, but also of the possibility of authorship of legal persons, and other such entities.

Griffin describes, that authorship should be more accurately described as a form of ownership rather than simply as a descriptive term.[20] In this sense the argument can be understood through the fact, that stating that someone is an author is not only a mere fact, but it also gives the author special rights, such as moral rights that are not transferrable. In this sense, authorship means at least the ownership of moral rights, even if the author has waived all their other rights to the created work

[20] Griffin, J. G. H., (2005) The changing nature of authorship: why copyright law must focus on the increased role of technology - *Intellectual Property Quarterly* vol 2 p.140

that is being protected by copyright. So it can be considered, that in one way, authorship is a form of intellectual property ownership.

For one work there can also exist more than one author at once, which is rather common in the modern day creative works, as a good example of that there are books written collaboratively by two authors. The collaboration runs so deep, that it is impossible to tell apart their respective contributions in the finished work. Their authorship of the finished work is equal. As a good example of this, there are for example crime novels written by ”Lars Kepler”,[21] who is not actually a person, but a pen name of a writer couple Alexandra and Alexander Ahndoril who collaboratively write Nordic crime fiction, and the finished novels are a good example of equal contribution.
However, the point being, we live in the world where artistic creations are produced as results of several natural persons' collaboration, when the authorship cannot be pinpointed to one single person, as there are several co-authors in a collaborative work. The current existing legislation of collaborative works could potentially be applied in relation to computer generated works, sharing the authorship equally between the machine and the natural person that developed the artificially intelligent software.

Another example of a similar type of phenomena is collective works, where the person who is considered as the primary author of the work, orchestrates the work, and organizes the work.[22] Then the work consists of smaller contributions by several other authors. A good example of this type of collective work, is the recently published portrait of Finnish president Sauli Niinistö,[23] where the portrait has been divided into 100 small squares, and each square of the work has been created by a different Finnish artist. However, Atro Linnavirta and Anita Naukkarinen have been the ones orchestrating the work, and organizing the 100 artists and planning the production of the portrait, thus being considered as the primary authors of the work.

Similarly this type of division of collective authorship could potentially be applied in future cases of for example self driving cars, that require several software developer's input under the supervision

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[21] larskepler.com/faqs/ 17.08.2018

[22] Dreier, T. K., (1995) Authorship and new technologies from the viewpoint of civil law traditions - *International Review of Intellectual Property and Competition Law*, 26(6) p.990

[23] Portrait of President of the Republic Sauli Niinistö on Display in Ateneum Art Museum, Finnish Government: 28.05.2018 https://valtioneuvosto.fi/en/artikkeli/-/asset_publisher/10616/tasavallan-presidentti-niiniston-muotokuva-esille-ateneumiin 17.08.2018

of the management, in creating an artificially intelligent software, that then goes on making independent decisions later on by itself, and potentially producing itself something worth of a copyright protection, such as for example different types of route plans, maps, or something of similar nature.

As described by the authors of article With love and kisses: nothing lasts forever; "…copyright law is preoccupied with the identification of one true author of a work. This fixation is problematic when applied to the collaborative process."[24] This is problematic when considering the issue from the point of view of the collaborative processes presented above. Also when considering the essence of this study, on computer generated works and authorship, the question turns even more difficult: can a machine be an author, or would it be legally possible for a machine and man to be co-authors of a work? The point of view presented in the above mentioned article is, that copyright and authorship are creations that provided clarity in the societal situation in the late 18th century situation, but they are not directly applicable, adjustable or suitable anymore for the modern environment of creating works.[25]

Collaborative works are also potentially somewhat challenging from the practical point of view, even if legally the concept would seem relatively clear. As described by Galison, especially in the field of academic literature and research in the fields of natural science, it is often surprisingly difficult to assign who are the people who have participated in the creative collaborative process of a research, and in practice it might be left up for office politics up to certain extent.[26] From this point of view presented, it could be drawn into a conclusion, that defining authorship in the practical or in the legal sense is not always simple or straightforward, even when all the potential authors are human by fact and by nature.

In France, it is possible that a legal person is the author of a collective work, based on the French Code de la propriété intellectuelle (CPI) Art. L.113-2(3), 113-5,[27] which provides a fascinating

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[24] Palahniuk, C., Hugo, V., Malraux, A., Bakunin, M., and others (2016) With love and kisses: nothing lasts forever: an examination of the social and artistic antiquation of moral rights - *International Journal of Cultural Property* vol. 23 issue 3 267- 294 p. 283

[25] *ibid.*

[26] Galison, P., Eds. Biagioli M., Galison P., (2003) *Scientific Authorship, Credit and Intellectual Property in Science* - New York, Routledge, p. 333

[27] Dreier (1995) *supra nota* 14, p.990

viewpoint for the argument, that natural person as an author it not as universal and given truth as could be considered. Even though as by principle and existing definition only natural person can be author, it is not set in stone, and in limited cases at least in France, which is still an European Union member state, there exists a fascinating way to approach the matter in limited cases in regards of authorship. Perhaps this type of solution for the future adaptation of authorship to suit the modern needs of the field of emerging technologies could be applied more widely in order to solve the issue we are facing regarding computer generated works?

An important thing to mention when it comes to legal persons and authorship, is, that by rule, all the creations created in the course of employment relationship, where natural person is employed by legal person, the author is the natural person who created the work, and the owner of the economic part of the copyright is the legal person who commissioned the work to be created in the first place.[28] However, even still here, the humanity of the creator is legally of utmost importance, and in the most part of the cases, it is hard to see this changing in relation to creative work and employment any time soon. However, again for the core of this study, it must be questioned, that what would happen, and how would it be regulated if one would in the role of a legal person purchase a machine that is able to do creative work? Who is the author? The person who uses the machine? The legal person that owns the machine, gives the required input, and uses the end result? For the time being there do not exist clear answers, but regardless of that, it is an important question to discuss in the legal field, as the future is closer than we think.

Deeming authorship is done whenever there exists the situation, when a computer generated work does not have an identifiable human author, and then a person is assigned as the human author of the work. Then there comes the problem, where there is a large and complex creation, in which there might exist more than one person who could be deemed as the author of the work.[29]

Deeming authorship is a current way of dealing with things, but it could be questioned if it really is the most efficient way of doing things. Also creating something, whether it is a map, a database or a computer software, creation comes with responsibility, and liability of the future implications of the usage of the work and it's functioning, so in that sense it could be questioned if it is fair to assign

[28] Dreier (1995) *supra nota* 14 p.991

[29]McCutcheon J., (2013) Curing the Authorless Void: Protecting Computer-Generated Works Following IceTV and Phone Directories - *Melbourne University Law Review* vol. 46 p.77-102 p.? III Option 1

authorship and thus also responsibility and liability of a computer generated work upon a natural person who might be closely linked with the creation of the work, but who in fact has not personally created the work and is not fully aware of the creation process of the work, and has not necessarily had the opportunity to affect it either.

1.2. Artificial intelligence

To put it simply, Artificial intelligence is a computer program or a software, that is initially developed or coded by a human author, or a group of human authors, which then utilizes machine learning to notice logical patterns and to produce further works based on the knowledge it gained from the input data. Many modern Artificial intelligence softwares are so complicated, that often there are several people behind the software, and not one single person can explain all the functions and intricacies of the software at one sitting. The ”artificially intelligent” software is able to mimic creation or is able to create (choice of wording depending on one’s opinion on the topic), artistic works, to write software and to make decisions in tangible world situations based on calculations that are made based on the input data.

Artificial intelligence, is definitely the most prominent emerging technology of our era. What is possible with artificial intelligence? Why is it relevant? Well, the possibilities include fully self-driving cars, drones, planes, cargo ships, and practically any transport vehicle one could imagine. Additionally there are fascinating products, such as Google’s Deep Dream software, that is able to take an image and process it in a similar manner as biological networks do, and in that way produce both unique and unpredictable artwork.[30] It is described by scholars, that creativity in itself is not something special and limited only to the human species, as humans like to think. Rather there exists three types of intelligence, combinational, exploratory, and transformational, and all those three can be modeled with artificial intelligence.[31]

It is thought by Sobel, that as a topic Artificial Intelligence is so trendy, because it is assumed by the general public (as well as by lawyers) to become the silver bullet to any potential problem we might have, such as boosting our productivity and efficiency, replacing human labour and even fighting

[30]Guadamuz, A., (2017) Do androids dream of electric copyright? Comparative analysis of originality in artificial intelligence generated works - *Intellectual Property Quarterly* vol. 2 p. 169-186 p.169

[31] Basheer, S. (2016) Artificial Invention: Mind the Machine - *SCRIPTed* 334 Volume 13, Issue 3, p.342

our wars.[32] Additionally Sobel points out an interesting question about the legal hype in the field of copyright: When photography was invented it was discussed if a photograph would amount to an artistic creation, same with video games. And, as Artificial intelligence in itself is essentially a software, even the question if a computer program itself can be an author for a copyright is not a new one, according to Sobel.[33] However, as history has shown us, for example a camera has been deemed to be a mere tool for an artist for their original creative expression, and the same might potentially happen with artificially intelligent softwares.

Sobel also described the problem of the existing copyright legislation in relation to machine authorship beautifully: ”Copyright law forces artificial intelligence into a binary: it is either a mystical author or a dumb machine. State-of-the-art machine learning is not exactly either.”[34] When it comes to a computer generated literary, dramatic, musical or artistic work the person who made the necessary arrangements for the creation of the work is considered as the author in the United Kingdom.[35] Then for another example, in Canadian Copy Right Act, the party who makes the necessary arrangements is granted the copyright, even though an identical provision does not exist in Europe without directly referring to a human.[36]

When it comes to the ownership of a copyright, or to the authorship, usually the person using the program is considered to be using it as a tool in order to express their own creative judgement.
Wagner in his essay describes the problem with authorship being assigned to Artificial intelligence software with a ”Chinese room argument” in which the computer knows how to process the binary instructions that the programmer created, but the computer does not understand the meanings or values of the words it is producing as a result. So in the way if you were taken to a room where no one speaks a language you understand, but you were given a card with replies to people’s questions. You would read your answers from the card in the incomprehensible language, and the other party of the conversation would be satisfied with the answers, but as you did not know what the questions

[32] Sobel, B. L. W. (2017) Artificial Intelligence's Fair Use Crisis - *Columbia Journal of Law & the Arts* 41 vol. 41 issue 1 p. 47 PAGE RANGE

[33] *ibid.*

[34] Sobel (2017) *supra nota* 24 p. 49

[35] Wagner, J., (2017) Rise of the Artificial Intelligence Author - *Advocate (Vancouver)* 527 vol. 75 part 4 p. 529 PAGE RANGE

[36] *ibid.*

or your replies meant, you are rather simulating a conversation in the strange language, not actually knowing that language.[37]

1.2.1. Machine learning

For the purposes of this thesis, it is also helpful to briefly describe what is machine learning. Artificial Intelligence could learn to generate literature, poetry, different styles of music, film, and visual art with the right input of learning material, this process known as machine learning. Machine learning means that based on a sufficient amount of data, the computer is able to detect the most significant characteristics of any type of art genre and to generate a work in a similar style. The greatest copyright related problem that Sobel sees with machine learning based on pre-existing copyright protected material is, that the copies used are often unauthorized,[38] and there is a vast amount of data that needs to be used as an input if there exists a wish to see results.

In machine learning, as described by Wagner, programs have the capability to shape the final course of their own programming, and even when the initial programmer has set an initial goal or objective for the program, the final result will still be a surprise for the programmer.[39] So, here ground rules are being set, for example ”create an original piece of baroque style music” and then based on the input data from which the computer has had the possibility to practice and ”learn” from, the computer has noticed the essential elements for baroque music and is capable of mimicking the originals in the outcome. The interesting part here is, whether it can be called true creativity, or just merely mimicking creativity, which is a matter described above with the ”Chinese room argument” example.

In order to develop into what artificial intelligence could be at it’s finest, it needs enormous amounts of data, and that is for example why currently giant corporations like Google and Facebook are having an advantage in this race, due to the nearly endless amounts of user generated data. In his article Guadamuz describes the innovation of creating artificial neural networks,[40] in order to mimic the functioning and efficacy of a brain for the purposes of creating an artificial intelligence, such as the above mentioned Google Deep Dream.

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[37] Wagner (2017) *supra nota* 29 p.531

[38] Sobel (2017) *supra nota* 24, p. 48

[39] Wagner (2017) *supra nota* 29 p.530

[40] Guadamuz (2017) *supra nota* 22 p. 171

Additionally there exists an interesting example of the usage of Artificial Intelligence from the field of computer gaming, and a popular game called the No Man's Sky, where the aim is to have a game that has no end, as the algorithm generates continuation for the game based on the set parameters. This type of functioning is called procedural generation, which is a method of creating content algorithmically.[41] So in this type of case it could be considered that the computer program, or Artificial Intelligence, is continuing the story of the game based on the gamer input, thus by itself creating continuation for the work without external help from anyone else but the player of the game.

In his Article, Sobel also tries to define expressive machine learning for the purposes of copyright definition, and he describes expressive machine learning as something where the computer trains on expressive aspects of works (that are created by humans), so that it can fulfill an expressive purpose, so ie. create something that could be called an expression.[42] So based on the existence of term "expressive machine learning" it could be deduced, that there exists mere technical machine learning that has to do mostly with purposes for engineering and functioning of technology as well as potential economical gain, such as the machine learning of the artificial intelligence used in self driving cars, and then there would exist expressive machine learning, that strives for the inherent value found in works of art created by natural persons as authors, that is also linked to moral rights.

1.2.3. Computer generated work

The main idea of a work being computer generated is, that it is not merely difficult to identify the human author from a group of people who could potentially be considered as authors of the work, but rather that there in practice exists no human author, and the computer has independently created the said work. For example in the United Kingdom, still an European Union Member State at the time of writing this thesis, there does exist a legal definition for computer generated works, in the Copyright, Designs and Patents Act (CDPA) from 1988, in section 178: "…the work is generated by computer in circumstances such that there is no human author of the work"[43] However, it can be also argued how much human involvement can be considered as "no human involvement" in order

[41] Guadamuz (2017) *supra nota* 22 p. 172

[42] Sobel (2017) *supra nota* 24, p. 49

[43] UK Copyright, Designs and Patents Act, CDPA (1988) section 178

for the computer generated work to actually be considered computer generated, instead of something created by a natural person author by using a computer software as a tool of creation.

For the sake of an example of a computer generated work, there exists a fascinating curiosity project in the field of computer generated works, the ”Next Rembrandt” project, where the data of original Rembrandt paintings was used as an input, and then the deep learning algorithm with the help of 3D printer and paint based ink was able to use several layers of paint in order to create original works in the style of Rembrandt.[44] This type of project could be under the current legislation in the field be described as a computer generated derivative work.

1.3. Liability and vicarious liability

One potential solution for the future is to recognize a machine as the author of the computer generated work, and then apply vicarious liability to it’s actions, decisions and creations, in order to solve the liability issue that comes when the natural person is not directly assigned the authorship of the copyright protected work.

As defined by William Prosser: ”Vicarious liability is the responsibility of one person, without any wrongful conduct of his own, for the tort of another. Its modern justification is a policy which places such responsibility upon the party best able to bear and distribute the risk.”[45] It is in no way a novel idea to discuss applying vicarious liability in relation to new technologies, as is proved by Article written by Heyting in 1930 about Automobiles and Vicarious Liability.[46]

As described by Fleming, vicarious liability is based on control,[47] it seems only reasonable to find the liability where the control of the functions lies. The machine might be the one to create the work, or to affect the final coding of the software, but at the same time for the foreseeable future there shall be some level of human control over the artificially intelligent machine in existence. So with this type of approach it would not seem the slightest bit illogical to apply the provisions of vicarious liability on the natural persons that are supervising and operating the artificially intelligent

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[44] The Next Rembrandt https://www.nextrembrandt.com/ Accessed 25.10.2018 at 11.20

[45] Prosser, W. (1941). *Handbook of the Law of Torts.* St. Paul, Minnesota, West Publishing Co. p.471

[46] Heyting, W. W. (1930). Automobiles and vicarious liability - *American Bar Association Journal* vol. 16 issue 4, 225-229. p. 225

[47] James, F. (1954) Vicarious liability - *Tulane Law Review* vol. 28 issue 2, 161-215. p. 165

machine. So, as an example of vicarious liability, it could be thought that for example a driver of a self-driving vehicle would be the one who is in control, and thus liable. Or optionally, that the party that assigns the updates for the software of the self-driving car is ultimately in control of the functions of the car, even if the car has ”a judgement of its own” and thus the company that issues the updates would potentially be held liable for any potential damages based on the concept of vicarious liability.

As pointed out by Bloom and others, it is also not necessarily simple to appoint vicarious liability.[48] Traditional vicarious liability is based on the idea, that master is in responsibility of the deeds of their servant, but the fact is, that we are living in a world of complex organizational structures and subcontracting. It could be that it would seem that the manufacturer is in responsibility of any damage that happens as a result of a malfunction of a self-driving car utilizing artificial intelligence, but it could also be, that the manufacturer of the vehicle has subcontracted the software development to another company, that on the other hand has potentially used other subcontractors in the development process of the artificially intelligent software that the car runs and makes it’s decisions on, and in that case it would be to put it mildly, rather challenging to pinpoint the liability over occurred damages to anyone.

The liability issue is further distorted and blurred with artificial intelligence utilizing software, as often it is the programmer coding the software, the user creating and loading the knowledge base for the software[49] and the software giving an end result that cannot be fully predicted. The problem with this type of functioning is, that when looking at the issue on a superficial level, it is unlike any other technology that has been legislated upon. Which one is considered to have more responsibility? The software developers that built the program and trained it, or the user that gave the program the type of input that caused the malfunction of the program?

One way to assign liability would be to consider autonomously functioning machines as agents of a person, whether natural or legal.[50] Also one opportunity according to Vladeck would be to assign

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[48] Bloom, A.; Ginsburg, W.; Kadzielski, M. A.; Waldie, K. (1994). Vicarious liability: How vicarious and how liable - *Whittier Law Review* vol. 15 issue 1, 151-176. p. 153

[49] Gerstner, M. E. (1993) Liability issues with artificial intelligence software - *Santa Clara Law Review* vol. 33 issue 1, 239-270. p. 244

[50] Vladeck, D. C. (2014) Machines without principals: Liability rules and artificial intelligence - *Washington Law Review* vol. 89 issue 1, 117-150. p.122

liability based on the existing system of products liability, as in the essence of the issue, even artificially intelligent machines are machines, and at least in the present moment we use machines as tools for human actions.[51] Vladeck criticizes the application of the current liability assignment to the manufacturer, when it might be impossible to identify the cause of an accident, and that would merely leave the manufacturer empty handed with no reasonable grounds for indemnity or contribution action.[52]

One way to approach liability and assigning liability can be also be through law of negligence, as described by Kamalnath; ”1. Does a duty of care exist? 2.Is there a breach of duty? 3. Did any injuries result from the breach?”[53] - Negligence seems very common sensical for grass root level operations and regulation of those operations, but on the other hand it might be a difficult job to establish liability in the case of damages caused by a malfunction, or just by a function that was not wished for being performed by an artificial intelligence in the form of a computer generated work, such as computer programming and the commands and decisions made in that process. When looked at the liability issue through the law of negligence, it might be a challenging situation to determine, does there exist a duty of care on the developer or perhaps on the user of the program utilizing artificial intelligence? Or perhaps there exists some type of a limited duty of care on both the developer and the end user? Before either proper legislation on the issue, or optionally established case law, this type of regulation on the issue based on duty of care and negligence in establishing liability is not an easy one to determine, as this type of approach on the matter would require further academic views and analysis on the potential practical applications of it.

Also there is an interesting example about what would happen, if a company would use artificial intelligence for making all the hiring decisions. At least in the current situation the software would run on big data and end up being prejudiced and discriminatory. The difference between human mind and a computer is partially, that a human is able to put aside information that they are required by law to ignore[54], as described by Sullivan in his article Employing AI. Here, if Artificial Intelligence was to be used, causes for damage claims would arise at least in the current

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[51] Vladeck (2014) *supra nota* 44 p. 127

[52] Vladeck (2014) *supra nota* 44 p. 128

[53] Kamalnath, A. (2018). Rethinking liability and licensing for doctors in the era of ai: Insights from company law - *Asia Pacific Journal of Health Law Ethics* vol. 11 issue 2, 33-50 p.33

[54] Sullivan, C. A. (2018). Employing AI - *Villanova Law Review* vol. 63 issue 3, 395-430. p. 407

development stage of the said technology. Even if currently people who have been subject to automated decision making have the right to ask for a human to re-assess the decision that was automated,[55] the situation is still problematic, considering that there are several fields of usage of decision making power in which artificial intelligence could be used for statistics based decision making, and where the usage would not be beneficial due to one of the main issues differentiating a computer from a human, computers function on numbers, but someone's abilities as an employee, or for example as a loan candidate at a bank cannot be fully perceived through numbers. A large part of these capabilities yes, undoubtedly, but humanity also functions on intuition and so called soft abilities and skills that cannot be necessarily measured by numbers. It would be useless to hire for example a customer service professional with a perfect sales record if the prospective employee would not be people oriented or have social skills enough to get along with the colleagues and the clients. These types of things an artificial intelligence cannot determine in a similar way as a person could, and that in addition to the fact that the artificial intelligence at its current state would most likely be discriminatory in a hiring process, would be an issue where from the point of view of avoiding liability for damages it is in the current situation to use people in the decision making.

Interestingly enough some legal scholars have suggested, that one way to handle with issue of determining intent, responsibility and liability of artificial intelligence would be using artificial intelligence to do that[56]. In an article by Etzionis the conclusion for the presented idea was that in the end we still need human control[57], and as could be argued, also human liability.

When it comes to seeing the unwanted outcome or damages caused by a computer generated work, is it necessarily even possible to claim product liability?[58] As described, if the computer program is not ”broken” or faulty, there is no cause of claiming that it would be a faulty product in question. However, product liability is something that is surprisingly commonly suggested as a solution for the functions of the Artificial Intelligence that are not sought after for. Product liability for the Artificial Intelligence seems like an obvious one in its simplicity at the first look, but the author of this thesis would approach the suggestion with caution. Considering the nature of artificial

[55] EU 2016/ 679 General Data Protection Regulation, Article 22 OJ L 127, 23.5.2018

[56] Etzioni, A., Etzioni, O. (2016) Keeping AI legal - *Vanderbilt Journal of Entertainment Technology Law* vol. 19 issue 1, 133-146. p. 139

[57] Etzioni, A., Etzioni, O. (2016) *supra nota* 49 p. 146

[58] Frank, S. J. (1987). Tort adjudication and the emergence of artificial intelligence software - *Suffolk University Law Review* vol. 21 issue 3, 623-678. p. 627

intelligence, which is based on learning outcomes of machine learning, which is based on a vast amount of input data, which enables the software to notice patterns and to perform it's functions based on this type of intelligence based on previous instances. However, this type of training is not necessarily a fool proof method for creating an error-free solution, as often at least example scenarios based on tangible world situations from the past are rarely perfect, and might potentially result in unexpected outcomes, that the developers who "trained" the program could not necessarily foresee. And in the case of unforeseeable function of an artificial intelligence, the function would be more of a feature that has resulted from machine learning and "drawing conclusions" from the process, and not necessarily meaning that there is a faulty product at hand. When the main function of a machine is to draw conclusions from the data, and it draws conclusions, it is not a faulty machine, even if the conclusions were not something natural people would have expected or hoped for. For example in a research paper published by University of Turku on the topic of autonomous ships, product liability is suggested as the guiding principle for assigning liability, but the author of this thesis holds, that it is not reasonable to utilize legislation reserved for faulty products, if the product functions exactly as it is supposed to, even if just in a way that was not wished for.[59]

Additional interesting question posed is, that for example in the field of utilizing artificial intelligence in the military, for example through autonomously functioning drones, would the human soldiers be placed in the organization merely in order to act as scapegoats whose primary function would be to absorb the liability for the wrongdoing as suggested by Calo.[60] Especially in military situations, when the question is of life and death, the author of the decision is an important question. In the current situation an artificial intelligence software cannot be considered as an author, and thus it does not have a copyright over the changes it has made on its own code, and the commands it has given to itself, so it is impossible to also consider artificial intelligence as something that would be in responsibility of decisions it has taken either, as the software itself is not in the current situation liable of anything that it does. Especially considering, that also in the field of military technologies artificial intelligence is one of the most promising novelties, it might either stall the development of artificial intelligence decision making if armies are afraid to use it because it could make mistakes and for example kill civilians, but also because it would mean, that the

[59] Collin, F., (2018) Maritime Product Liability at the Dawn of Unmanned Ships – the Finnish Perspective - University of Turku UTULAW Research Paper Series 2/2018, p.1-24. p. 1

[60] Calo, R. (2017) Artificial intelligence policy: primer and roadmap - U.C. Davis Law Review vol. 51 issue 2, 399-436. p. 416

person who was supervising the autonomous drone that makes its own decisions could be potentially held liable for the wrong decisions that the natural person in reality had nothing to do with. Additionally there is the possibility that the development of these technologies would be slowed down or outright hindered by liability issues, as under current legal culture also the manufacturer, and the developers could potentially be held liable for so called malfunctions of the artificially intelligent software. Undoubtedly, not a single human would like to assume a professional position where they would be liable for something they did not intentionally or even through negligence commit, and in practice have nothing to do with.

When it comes to artificial intelligence and liability issues, one way to look at the issue is through vicarious liability, in the sense that the AI machine you are using is in a way not anymore the same as the one you initially purchased, because the machine is merely an ”extension of your preferences and abilities, narrowing its focus to accommodate your specific tendencies.”[61] And, as argued by Semmler and Rose in their article, it could be, that it is your tendencies that cause the artificial intelligence, or the computer generated worked that is being created by the Artificial Intelligence, to end up causing damages. So in the end by utilizing vicarious liability in this way, it would the user to be held liable for the damages. In its own way this would make sense for the author of this thesis. Artificial intelligence learns the user’s preferences and tries to follow the pattern of preferences it has noticed. For example this is why for example on social media the social media service feed is tailored for each user according to their preferences, and the tailoring is based on the previous functions the user has performed, in order to keep the feed interesting for the user. In usual cases most of the functions performed today by artificial intelligence utilizing software are based on the learning data that the user supplies as a constant stream for the software through the usage of the software or for example a service on social media. There is no reason why this type of learning process through practical situations would not be used with for example self driving cars, autonomous ships or autonomous drones. Especially with these types of applications it would be sensible that the user who was the one to input the learning data would be responsible, as an unused product is a blank page so to say, and only evolved for comfort after a certain amount of training. An easy and concrete real life example of this would be mobile phone autocorrect keyboards, that are clumsy in the beginning of usage of a new phone, but when the keyboard learns the vocabulary of the user, it turns into an useful tool for faster writing. However, the severity of what could go

[61] Semmler, S., Rose, Z. (2018) Artificial Intelligence: Application Today and Implications Tomorrow - *Duke Law Technology Review* vol. 16, 85-99. p. 97

wrong when using a mobile phone autocorrect keyboard and an autonomous military drone are on completely different risk levels.

One of the most entertaining ways to put one of the biggest notions on the topic of artificial intelligence and liability is how software developers participating in the development or artificial intelligence would be better off by already preparing for possible unfavorable future court rulings ”to protect themselves from looming liability”[62] because at least in the way Koweit is seeing it, the courts would go after the developers when something bad happens. However, what could this type of preparation be? Giving up the research and developing because the legal risks and through those, the possibilities of economic loss at the face of unfavorable judgement on liability, are too high? Starting a vast lobbying operation on the topic of liability issues before properly launching products for mass consumption? Hiring an army of legal professionals to come up with precautionary suggestions for the product and for the user contracts? There is no doubt, that the technology companies will need to prepare for the liability issues when it comes to their products, however, it is definitely a challenging job, when the legislation and caselaw on the topic are everything but established, and even the academic writing on the field is mostly based on speculations of different ideas.

One of the suggestions for allocating liability or the potential ways of regulating it in the future would be utilizing the tort system in the common law countries instead of direct legislation[63] on the topic, as it would be easier to achieve balance with practice and rules in this way, also it would incentivize the developers to incorporate security by design features in the AI systems. However, it could be assumed, that anyone who would start developing an artificially intelligent software today would already think of security by design in order to avoid legal problems in the future.

Another interesting question when it comes to artificial intelligence and liability issues is, that if we would consider artificially intelligent system in the role of an agent, would the system be possible to

[62] Kowert, W. (2017) The foreseeability of human artificial intelligence interactions - *Texas Law Review* vol. 96 issue 1, 181-[iv]. p.203

[63] Scherer, M. U. (2016) Regulating artificial intelligence systems: Risks, challenges, competencies, and strategies - *Harvard Journal of Law Technology* vol. 29 issue 2, 353-400. p. 389

hold up for criminal liability?[64] Considering the input given is from humans. Or would we lock the computer to a state facility so that it would learn from it's bad deeds and behave better next time?

[64] Lima, D. (2018) Could AI agents be held criminally liable: Artificial intelligence and the challenges for criminal law - *South Carolina Law Review* vol 69 issue 3, 677-696. p. 681

2. THE LEGAL RELEVANCE OF THIS DEVELOPMENT

According to Wagner, from a legal point of view, what we are needing here is a practical solution for a future with independently functioning and creating machines.[65]

Wagner presents that there are two potential practical solutions for the situation:

1) ”If the AI program displays creativity and judgement as part of its creation of works, should it be granted copyrights for its own works?”[66]
2) ”If the AI will not be granted copyright over the works it has created, does the copyright belong to the programmer, even when the programmer has control over the inputs of the AI program, but has no way of predicting the output, the resulting work?”[67]

In 2019, a new Copyright Directive[68] relating to the digital single market was adopted by the European Parliament, but has not been implemented yet at the time of writing this thesis. This thesis will not go further in depth with that directive, as the directive does not provide new developments to the previously existing directive from 2001[69] in regard of computer generated works, but rather focuses on development on issues related to exploitation of human authored works in the digital environment.

Also another practical consideration is, that regardless of who or which, the AI or the programmer, creates the work usually this is done during the course of an employment relationship on working time, when the copyright automatically belongs to the employer.[70] However, this still leaves the question of the moral rights, even if the economic rights would be solved easily with the question of employment. Additionally it could be noted as related to the topic, that even if the Artificial Intelligence commits to a decision for example on hiring a person, admitting a loan, or for example destroying a military target, the technical decision can be found in the format of computer coding, and thus copyright protected, but as the computer cannot be currently considered as an author, who is liable for the moral side of the potential discrimination or loss of life in vain and by an accident,

[65] Wagner (2017) *supra nota* 29 p.531

[66] *ibid.*

[67] *ibid.*

[68] Parliament and Council legislative resolution on proposal for a Directive (EU) COM(2016)0593 – C8-0383/2016 – 2016/0280(COD)) of 26 March 2019 on copyright in the Digital Single Market

[69] Parliament and Council Directive (EC) 2001/29 of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society (Copyright Directive) OJ L 167 22.06.2001 p. 10-19

[70] *ibid.*

if there does not exist a legal author of the decision, in this case the one, the Artificial Intelligence, that wrote the computer code that enabled the execution of the decision, who would be held liable for the damages that have occurred?

The easiest solution for the issue of copyright might be the UK way of dealing with the issue, by assigning the copyright to the person who made the practical arrangements for making the creation of the work possible, without even going that deep in legal philosophy of wondering whether or not a machine can have author's rights and if it would be smart enough to be insulted by deprecating usage of the work that has been created, as machines, at least for the time being are not sentient beings that would possess what most people and philosophers call a "soul", like humans.

However, according to Wagner, there would perhaps need to be a legal adjustment in the copyright protection of computer generated works when compared to human created works. Currently the copyright is tied to the life of the author, and still lasts 70 years after the author's death, at least in the European Union and in the United States. However, machines do not really die, so there would be a good space for improvement in setting some type of legal time line for a copyright of computer generated works, so that the copyright would not last for a potential eternity.

With the highest likelihood, there will also exist a need for some level of human control over artificial intelligence, since at least based on one good example of artificial intelligence, a Twitter robot called Tay that was built by Microsoft, went rogue, as it was spurting out racist comments based on what it had learned through machine learning, not necessarily being the optimal example of an outcome of the opportunity of independently functioning machines.[71]

In his article, Dreier is wondering that with the development of emerging technologies, the whole question of authorship and the moral rights related to it, might turn old-fashioned, and mostly irrelevant, at the same time as the digital context turns more prevalent.[72] The author of this thesis to some extent agrees with Dreier on the issue; It could be described that with emerging technologies such as Artificial intelligence there will most definitely exist a need to adapt the currently existing legislation in the field to suit the real life applications, but on the other hand the author of this thesis

[71]Griffin, A., *Tay Tweets: Microsoft shuts down AI chatbot turned into pro-Hitler racist troll in just 24 hours.* The Independent 24.03.2016 https://www.independent.co.uk/life-style/gadgets-and-tech/news/tay-tweets-microsoft-ai-chatbot-posts-racist-messages-about-loving-hitler-and-hating-jews-a6949926.html 29.10. at 10.48

[72] Dreier (1995) *supra nota* 14 p. 998

does not see that it would necessarily need to happen on the expense of human authors and their moral rights on the works that have been created by them. A potential solution for the situation could be using copyright as an umbrella term just in the way it is being used today, but perhaps aim for a stricter separation between moral and economic rights, only granting moral rights to natural person authors, and potentially even waiving the whole concept of authorship when it comes to machine created works, as their main value is primarily economic, at least in the light of the current applications of Artificial Intelligence.

The author of this thesis is suggesting this type of approach based on Dreier's and other scholars' views, as it is already a practical legal reality, that copyright is not being used only for the protection of natural person created artistic works with cultural value, as perhaps it was initially intended. Computer software, which mainly does not serve an artistic, but rather a technological and inventive function is being protected in majority of the cases as a literary work, even if it actually shares a lot of characteristics with works that can be also protected by patents for the economic significance of the inventive technical product that can be mass produced, that is protected by patents in order to protect the incentive to create new technical and technological innovations. It could be argued, that this type of legal void could have been avoided, if computer programs were protected with patents or some similar type of protective instrument instead of copyright right from the beginning. Then at least the question of authorship would be irrelevant, as it could be seen more as a situation directly through property rights, if one owns a goose that lays golden eggs, the owner of the goose naturally has the property right to the golden eggs as well, even if some problems with the question of inventor might be similarly difficult in the field of patent law as well.

A fascinating issue that Dreier points out, is that currently there are two ongoing developments, the first one being the technical freedom to manipulate and appropriate someone else's copyright protected material, and at the same time second one being the legal and technical efforts to safeguard the author's or the right owners' interests from the before mentioned manipulation and appropriation that is today easier than ever before.[73] This question is also significant from the point of view of the usage of artificial intelligence, because as noted previously in the thesis, it is easy to face copyright issues with Artificial Intelligence already to start with, when it comes to the mass of data used for machine learning. Who is the copyright owner of the input material, and how should

[73] Dreier (1995) *supra nota* 14 p. 999

they be compensated for the usage of the material under the copyright owners' domain in the learning process? This is an another legal challenge to be faced already in the current situation.

Also if the practical legal solution for the issue would be, that instead of using single copyright, due to issues of computer not being a natural person when creating a work, there could be used joint authorship, but however, with human created works, if there is a lack of collaboration, instead of joint authorship, smaller independent creations are protected as several smaller independently authored works.[74] So, when there is a computer generated work, where the real collaboration is minimal, how would one legally define joint authorship in that case? It couldn't differ too much from its human definition, or the credibility of the whole concept would suffer, but at the same time at least with an advanced Artificial Intelligence, there is very little "joint" in the term joint authorship. In the face of the issue of joint authorship it could be seen that there is no point in changing the definition of joint authorship, because it serves perfectly well in cases where authors are natural persons, and it would not even be a perfect match for the cases of computer generated works being created under the supervision of a natural person.

As McCutcheon presents, fictionalizing an author in the situation when there does not exist a human author, creates problematic situations in regards of corporate authorship, with the duration of the term of protection, moral rights and potentially also with joint authorship. However, in the author's view, those problems are rather something that would not be surmountable.[75] Here the author of the thesis can fully agree with McCutcheon, as the solving the issue in a satisfactory manner would require a great attention for detail, however, as McCutcheon puts it, this issue would not be surmountable, and if there would exist enough will and determination to solve the issue it could be done, in a similar manner as several previous legal issues with emerging technologies have been dealt with in the past as well.

One solution McCutcheon presents in their article, is that computer generated works could be called something else than works, for example "material" and in that way the greatest pitfalls of the currently existing copyright legislation could be avoided.[76] In the author's view, that type of

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[74] McCutcheon J., (2013) Curing the Authorless Void: Protecting Computer-Generated Works Following IceTV and Phone Directories - *Melbourne University Law Review* vol. 46 p.77-102 p.77

[75] McCutcheon (2013) *supra nota* 65 p. 78

[76] McCutcheon (2013) *supra nota* 65 p. 79

solution would reward the party who has made significant investments into the creation. So with this type of approach, copyright would be rather similar as with database protection, not really being that much about the originality, creativity and expression, but rather a tool to protect the investments that have been made in the creation of the work or ”material”. Also this type of solution would be practically quite a functional one when considering the modern course of action, where usually copyrights are owned by the employer regardless of the fact, that the employee in the role of an author is the one coming up with the copyright protected solution. So here in a way the solutions or ”material” that would be created by the artificial intelligence would be relatively on the same level as employee created material, or works.

With this type of solution of calling computer generated works as ”computer generated material” the right of reproduction would be lost, but the right of making copies would be obtained. Additionally the right of performance would be lost, but however right of making the work available to the public would be gained, as McCutcheon analyses. Additionally in the vision of McCutcheon rights of adaptation and first publication would be completely lost, because material would be a completely separate concept from ”work”.[77]

According to the European Database Directive, a database gains a protection under copyright in order to protect a substantial investment that has been used for obtaining, verifying and/ or presenting the data in the database.[78] The author of this thesis sees this type of logic as very sensible way to approach the matter, as it would remind an already existing legal instrument, the European Database Directive, so there would not exist a need to reinvent the wheel, but a solution that has already been deemed as a functional one could be merely adopted in a new field in order to incentivize the development of new technologies and to protect the investments made in the course of the development process of those technologies.

The main argument presented in McCutcheon’s article for the protection based on the Database Directive, is that databases, just as computer created works, or computer created ”material” for that matter, are expensive and laborious to compile (or bring into existence), and this type of protection would prevent free-riding. However, McCutcheon also notes that there is a need for a delicate

[77] McCutcheon (2013) *supra nota* 65 p. 88-89.

[78] Directive 96/9/EC of the European Parliament and of the Council of 11.03.1996 on the legal protection of databases Art. 7 para 1

balance, in order to not over protect works that have been created with low investment, which would then exclude the legitimate users in need of protection.[79]

When it comes to the European Union Database Directive, that could theoretically be used as a model for creating a legal tool to regulate the protection of computer generated works, in the existing Directive, the maker, of the database os considered to be the person who has taken the initiative and the risk of investment into the creation the database.[80]

Additionally McCutcheon considers that database directive could offer functional inspiration for the regulation of the duration of the protection in regards of computer generated works, as in the European Union Database Directive the protection of a database lasts for 15 years, and then the term of protection can be extended, in the case there has been made new substantial investments that result in a substantial change to the contents of the database.[81] However, interestingly enough there exists a question, if this would make it possible for a computer generated work to receive a practically eternal copyright protection, if the computer itself for example codes the security patches, say to the program of a self-driving car, as an update, depending on the case, could potentially be considered as a ”substantial change in the content” of a computer program?

However the copyright matter will eventually be solved, as the author of this thesis sees it only as a matter of time, it will organically reflect also on the liability issues related to the computer programs, and either the authorship and liability issues related to computer generated works could be solved together, in which case the legal space would potentially end up regulating Artificial Intelligence related topics in a coherent way, or optionally the authorship issue will need to be solved first in order to determine anything more profound on the topic of liability. The way the linked issues will be solved is dependent upon if the issue is considered important enough for its own legal instrument such as a regulation or a directive, or if it will be up to the courts to decide and to create case law on how to approach this matter.

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[79] McCutcheon (2013) *supra nota* 65 p. 88-89.

[80] McCutcheon (2013) *supra nota* 65 p. 97

[81] McCutcheon (2013) *supra nota* 65 p.98

3. ACADEMIC VIEWS ON ALTERATION OF THE EXISTING COPYRIGHT LEGISLATION

3.1. Academic views in favor of alteration of the existing copyright legislation

Sobel presents, that in its own way, Big data that is used by Artificial Intelligence for the purpose of machine learning, ought to be understood as repackaging human labour, instead of automation that has merely appeared into existence from a vacuum. His argument therefore is, that even the works created by humans do not pop out from a vacuum, but are expressions in a historical sequence of original works, that have been influenced by the previous works. With his logical reasoning, Artificial Intelligence going through machine learning and generating works based on that, is merely doing the same as human society has been doing for all of our history, and seeing the issue from that angle, it would be possible for a judge to deem that a work created by machine learning would be a derivative work.[82]

In a way the author of this thesis agrees with Sobel, all types of art created within the course of human history is always based on the previous artistic creations, and in its essence, artificial intelligence software is merely doing this type of ”brewing” of previously existing material significantly faster than generations of human beings. However, it might be problematic to see all works created with artificial intelligence as being derivative works, because holding to the reasoning of all art being based on it’s predecessors, it would also mean that all art created by natural persons would be derivative works as well, because the type of art humankind creates is always in one way or another based on the types of art or culture the generations before us have created.

When it comes to the topic of being welcoming of changing the copyright legislation in order to better facilitate computer generated works, Griffin, in his article is providing a few very good reasonings for the cause. Firstly, when the currently existing norms are being strictly enforced, without allowing new forms of authorship to be developed, the natural development of author might be hindered. So, in its own way, as Griffin sees the issue, we ought to not compare works that are created by human authors and that are computer generated as equals, because there is also in existence the opportunity, that protecting the two types of works with the exact same existing norms

[82] Sobel (2017) *supra nota* 24, p.93

might hinder also the human creativity, because when you run a very powerful computer, it is merely the question of time when it is able to hit the exact wording a human author would choose[83]. Griffin in the opinion of the author of the thesis has a very sober view on the topic, with the type of attitude that reflects that there is no point in trying to fight the inevitable, as it is not beneficial to anyone. Perhaps authorship by machines could be considered as a similar development as the birth if the legal term ”legal person” back in the day. Before the legal field started calling companies as persons, it seemed obvious that only a human being could be called a person. However, the world has not collapsed, humanity still exists, and it could be argued that the creation of the concept of legal personhood has mostly been beneficial for the development of society and business. So it could also be seen, that perhaps if artificial intelligence that was creating any type of copyright protectable works would be granted some type of a personhood it would also be a beneficial development for the society as a whole?

In his article Solum argues very convincingly for the theoretical scenario of giving artificial intelligence a legal personhood. From the article can be concluded that the matter ought to be treated as a priority resolve, because currently we are running towards the great unknown and we do not have the means to handle it and its implications when the time comes, as put by Solum.[84]

3.2. Academic views opposing to the alteration of the existing copyright legislation

In her article People not machines: authorship and what it means in the Berne Convention, Ginsburg supports the idea of keeping copyright human centric as it is in its current form.[85]
In her view under the Berne Convention, if the human intervention on the ”creative process” of the machine, does not exceed merely requesting the machine to generate something, then the work is computer generated, and there exists no human author. She wittily compares that in the situation where the Pope requests the Sistine Chapel to be painted, presenting the request does not make the Pope the author of the paintings in the Sistine Chapel, but the author will still be the person who was requested to conduct the work, and who completed the work, Michelangelo.

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[83] Griffin (2005) *supra nota* 12, p.154

[84] Solum, L. B. (1992). Legal personhood for artificial intelligences - *North Carolina Law Review* vol. 70 issue 4, 1231-1288. p. 1231

[85] Ginsburg J. C., (2018) People not machines: authorship and what it means in the Berne Convention - *International Review of Intellectual Property and Competition Law* vol. 49 issue 2, 131-135 p.132

Gingsburg references quite a lot to the works of Professor Ricketson, who is strictly opposed to copyright objectives that would have to do with the commercial, rather than the intrinsic artistic value of the copyright protected work. She does argue, that Berne Convention in itself greatly focuses on the natural rights of the author, whereas the system more often followed in countries that have common law approach to legislation, where the aim of copyright is rather to incentive people to create things and also disseminate works of other authors in order to create greater societal benefit.

However, even Berne Convention in itself doesn't completely ignore the commercial value of copyright as a legal tool, however, not completely ignoring something according to Ginsberg is very different from actively embracing copyright solely as a tool for incentivizing commercial activities.[86] Her reasoning is, that as copyright, as understood in the view of the Berne Convention, is so deeply linked with the humane side of artistic creation, ought not be reduced into a tool merely for financial ends, but rather create a system where creations with commercial goals would be protected with a less wide scope.[87]

In her opinion, before rushing into creating new legislative tools to control and to regulate computer generated works, it would be required to actually search through the possibilities provided by existing legal tools, such as through the copyright or patent protection given to computer softwares, patents that are given to machines that are used for producing "works of fine and applied art", existing copyright or the European Union *sui generis* protection that is used for databases. However, even with these opportunities, in the article Ginsburg is not very welcoming of the thought of automatically granting computer generated works a *sui generis* protection as a default or extending the existing copyright. Also she refers to Berne Convention article 2, about how a state that is a member to the Berne Convention, is not required to protect computer generated works, as they do not have human author.[88]

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[86] Ginsburg (2018) *supra nota* 78 p.134

[87] *ibid.*

[88] Ginsburg (2018) *supra nota* 78 p.135

In the view of the author of this thesis, Ginsburg's view can be seen as sensible an understandable, maintaining copyright for the purpose it was initially created for, to protect the intrinsic artistic and cultural value, and the economic rights of an artist or an author based on the success of the work. Even the idea of looking into legal instruments already currently in existence is a sensible one, but however, it must be noted, that unlike Ginsberg thinks, in the opinion of the author of the thesis, a creation of a new legal tool ought not to be completely ruled out of the question either, if it would be the best way to serve its function and purpose in protecting computer generated works for their economic value and for solving the liability issues related with them, while simultaneously still maintaining copyright that currently exists as the means of protection reserved for natural person authors, to best serve their rights and to ensure their legal security with the concepts of author's rights and moral rights.

4. APPLICABLE CASE LAW

4.1. Infopaq C−5/08

Infopaq case has been one of the corner stones among the rulings of European Court of Justice in the field of copyright. What happened in the case, was that a company called Infopaq international was selling news clips, that had been scanned from an image, and then with text recognition turned into an 11 words long piece in order to be sold for the clients of Infopaq. The Danish newspaper association sued Infopaq for copyright infringement, as Infopaq had used as base material for scanning the articles published in Danish newspapers. The question for the European Court of Justice was if the 11 words long pieces were original enough, and ended up deciding, that they indeed were sufficiently fulfilling the criteria of author's own intellectual creation in order to grant copyright for the small pieces.

This decision formed the ”Infopaq standard”[89] where the European Court of Justice took the view, that the selection process: ”through the choice, sequence and combination or those words”[90] could express the author's originality and thus be considered as their own intellectual creation.

The relevance of the Infopaq case is clear for the purposes of this thesis, the ”Infopaq standard” is the closest we have come to a harmonized European Union definition of authorship in the recent years. The fascinating part with the legislation is, that unlike in some of the Member State's national legislation, humanity is not explicitly required. However, naturally it can be argued, whether a computer or the software functioning on a computer could be considered as having its own ”originality” or ”intellect” for creating anything that could be described as an intellectual creation. So the next essential partially philosophical question for the purposes of further legal developments would be, if intellect is considered only as a human trait, or is it something wider that does not necessarily need to be human.

4.2. Feist Publications v. Rural Telephone Service 499 U.S. 340 (1991)

Situation with in the United States, when it comes to the United States approach to the matters of copyright and definition of author, there exists a famous case, Feist Publications v. Rural Telephone

[89] Guadamuz (2017) *supra nota* 22 p. 180

[90] European Court of Justice, C−5/08, 16.07.2009, Infopaq International A/S v Danske Dagblades Forening

Service, about phone directory and its originality. Rural is a telephone service company and it published phone directory with white and yellow pages. Feist Publication was creating phone directories covering wider geographic areas, and at request for licensing the directory for Feist's directory, Rural refused from licensing. End result to spark a dispute was, that Feist extracted the information from Rural's directory without a license, with some changes made to the listings, but also listings being partly identical. In relation to the case the United States Supreme Court commented: "Common sense tells us that 100 uncopyrightable facts do not magically change their status when gathered together in one place."[91] So, the end result was that there was no special copyright protection for these listings, whereas with the protection of databases by copyright the European Union is doing the exact opposite. So, deduced from this case, in the United States, there is a rather established view of a natural person as an author, in a similar way as mostly in European Union as well, apart from the European Union view of databases.

Even if this case is a very strong indication of the firm view of natural person as an author, scholarly legal discussions rarely sprout from a vacuum, and there has existed such an amount of different scholarly views on the topic of the personhood of the author, also widely presented in this thesis, so it could be considered, that at least when it comes to the United States, this case provides a starting point in regards of the legal culture, but it does not mean that the starting point indicating the current position of the Supreme Court would be an unchangeable view, once given, fixed in stone for the upcoming eternity.

4.3. IceTV Pty Limited v Nine Network Australia Pty Limited HCA 14, S415/2008 (2009)

In 2009 High Court of Australia gave its decision about a case of television weekly schedules.[92] Nine Network claimed that IceTv had committed a copyright infringement by publishing the weekly television schedule of programs that were going to be broadcasted by Nine Network. The claim was, that IceTV has taken the time and title information from Aggregated Guides, a company

[91] United States Court of Appeal, Tenth Circuit, 89-1909 499 U.S. 340, 27.03.1991 *Feist Publications Inc. v. Rural Telephone Service Co*

[92] High Court of Australia, HCA 14 S415/2008 *IceTV Pty Ltd. v. nine Network Australia Pty. Ltd.*

that was authorized by Nine Network to publish the weekly broadcasting schedule of Nine Network, and used the information to publish IceTV's own IceGuide. In the view of Nine Network each Weekly Schedule published was a compilation, and thus protected as a literary work under the Australian Copyright Act from 1968,[93] and thus IceTV's actions constituted a reproduction of a substantial part of copyright protected work. The judges of the Australian High Court saw, that the authors of Weekly Schedule by Nine Network had "…little, if any, choice in the particular form of expression adopted, as the expression was essentially dictated by the nature of the information. The expression lacks the requisite originality for the part to constitute a substantial part."[94]

As analyzed by McCutcheon, caselaw on European Database Directive has clarified that the Directive does not protect data that has been created as a by-product of other commercial activities, and that view stance is in line with the Australian IceTV decision.[95]

The relevance of this case is, that there is a need of originality of the work, and mere computer generated compilation of data does not constitute originality that would fulfill the criteria of copyright protection. In its own way there is nothing surprising about the decision, and it is easily applicable in the current situation, however, it gives us very few tools or guidance for future, where the requirement of originality might be fulfilled by computer generated works.

Additionally when analyzing the decision of the case further, even if the case was brought to court and judged in Australia, this does not mean that similar circumstances and a similar case could not have occurred in the European Union. Thus, it is interesting to note, that based on the current European Union Database Directive, the data that has been as a by-product of other commercial activities is not worthy of protection. So, in that sense the reasoning between European Union and Australia also differs, even if the end result would be the same; From the Australian point of view, as the presentation of data was strictly dependent on the nature of data, it could not have been presented in any other sensible way, and thus it is not an intellectual creation or worthy of protection. Whereas the European Union logic is based on being a "by-product of other commercial

[93] Copyright Act 1968 No. 63, 1968 (Australia)

[94] High Court of Australia, HCA 14 S415/2008 *IceTV Pty Ltd. v. nine Network Australia Pty. Ltd*, para 16-17

[95] McCutcheon (2013) *supra nota* 65

activities" which means, that if the database that was in Australian opinion unoriginal and not worthy of copyright protection, could potentially receive protection under European Union jurisdiction, if it was not the by-product but the main product. So once again, the Database Directive has the scope to grant copyright protection to works that are not necessarily tied to the level of human intellect presented in the creation or to the originality originating in a natural person's mind, but rather to the fact that there exists an economic benefit to be gained in the work. So this could be potentially seen applying also on works created by artificial intelligence as well, as currently a lot of works that are being created by artificial intelligence are databases, because of the capability of a computer processing vast amounts of data with high speed, in comparison to the natural persons' capabilities in the same task. Based on the type of data base creating program, it could be possible that also an Artificially Intelligent database creation software could apply its own intelligence in forming those databases, by choosing the information and dividing it into presentable categories based on utility and "sensibility" that a natural person has not necessarily automated into the program, but has given the program free hands in terms of choosing the most logical way of presentation, in which case even the programmer of the artificial intelligence is not necessarily fully aware of what type of outcome to expect, even if the inputs most likely are well known. So in this sense, with the above given reasoning and analysis of this case, at least in the European Union potentially it could be considered that a natural person is not the only possible answer for the question of granting copyright and allocating authorship.

4.4. Nova Productions v Mazola Games Case No: A3/2006/0205 (2007)

The case of Nova Productions v. Mazola Games is an extremely fascinating one for this thesis. In the case the defendant was claimed to have produced two games that were infringing on the plaintiffs copyright. However, at no point of the events the source code had been copied, but regardless of that some graphics and some frames in the games were extremely similar to each other. The games of the defendant that were claimed to be infringing, were computer generated works, and the programmer had made the necessary arrangements for such computer generated work to be brought to existence, and was for that reason traditionally considered as the author of the work.

The United Kingdom Court of Appeal also addressed a novel possibility: potential authorship of the user.[96] As the gamer playing the game is having an effect on the game with their input, and the frames that were in question, and their appearance were dependent on the way the game was being played by the gamer. However, the court also deemed, that the player of the game was giving no artistic input or contributed artistic skill or labour to the game. This court judgement gave an opportunity for future development of considering an user as the author, if they contribute artistic skill and labor to the work.

What makes the Nova Productions v. Mazola Games case so relevant is, that here we have an actual dispute over the copyright of a computer generated work. The judgement supports the view of the developer of the game that then generates further works protected by copyright as the owner of all copyrights. As a novel other opportunity it is seen that the person who plays the game could be the one who gains the authorship over the finished product, because the player was the one to make the necessary arrangements within the game for certain types of frames to come to existence. However, when it comes to the actual authorship, it could still be argued, that the game developer did not know such exact frames were to be created, even if they were the one to design the game. On the other hand, the player of the game did not know that such frames were to be created based on their actions either, they were playing the game, and not going through a creative process. So it is left for questioning if on a theoretical and argumentative level at least, it could be, that neither the game developer or the player would be the ones to have the authorship of those frames, but the game itself. Legally the last option would obviously be practically more difficult to regulate, but the fact that something is difficult does not mean that it would not be worth doing or worth investigating further.

4.5. Telstra Corporation Ltd v Desktop Marketing Systems Pty, FCA 621 (2001)

Case about Telstra and Desktop Marketing Systems is relevant for the topic from the point of view of joint authorship of computer generated works. Telstra had the copyright to the listings of phone directories of the white and yellow pages that they were publishing. Desktop Marketing Systems in its own way reversed the directories, to be searched by number instead of by name, and the court deemed that the content published by Desktop Marketing Systems was almost identical with

[96]England and Wales court of Appeal, A3/2006/0205 (2007) *Nova Productions v Mazola Games* para. 106

Telstra's phone directories. In the course of the case popped up a question about joint authorship of works: "Is every employee who contributes to the final product a joint author of the directory?"[97] and the judge saw that there does not exist readily answers for these types of difficult questions.[98] However, this exact question is relevant for computer generated works, and is still waiting to be answered properly. Is every employee who contributes to the artificially intelligent software a joint author of the end product created using the AI software?

This question is especially important when questions arise on topics artificially intelligent technologies that have not yet been properly regulated, such as self driving cars or unmanned ships.[99] For something like an unmanned ship or a self driving car to be functional, there is such an amount of software code required, that even the best professionals could not create such entities alone. So, behind such an invention there is always a team, and the more complicated the project is, the larger the team is. Traffic accidents may happen on the road or in the sea if the artificially intelligent software running the vessel malfunctions. Who ought to be in responsibility of this type of malfunction? Ordinarily the responsibility is assigned to the manufacturer, but on the other hand, what if the manufacturer did not design the vessel? And even further, what if engineers from different subcontractors designed different parts of the artificially intelligent software to enable the vessel to move unmanned? Especially when considering how difficult it could in practical reality to find the faulty part of the code that lead to the accident, the people working with legislation, and for example in the field of insurances, are having difficulty in assigning liability for potential accidents. Is the self-driving car or the unmanned ship taking independent decisions "the author" of the accident? Is the responsible party the manufacturer of the hardware? Or would the responsibility fall upon some of the software developing subcontractors even when the software as a whole is supposed to work as a single entity, regardless of how many people were developing it?

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[97] Federal Court of Australia 181 ALR 134, 136 (2001) *Telstra Corporation Ltd v. Desktop Marketing systems Pty* para. 4

[98] *ibid.*

[99] Collin, F., (2018) Maritime Product Liability at the Dawn of Unmanned Ships – the Finnish Perspective - University of Turku UTULAW Research Paper Series 2/2018, p.1-24. p. 1

4.6. Bezpečnostní softwarová asociace C−393/09

In the case of Bezpečnostní softwarová asociace, the Czech Ministry of Culture had refused to grant Security Software Association BSA authorization to carry out collective administration of copyrights in computer programs.[100] The case ended up to the European Court of Justice due to uncertainty on the definitions of the EU copyright legislation. European court of Justice had to deal with the question whether or not a graphic interface on a computer was a ”work” in accordance with the European Union Copyright legislation.

The end result of the case was, that the court ruled, that it is possible to consider a graphic user interface to be a work in accordance with the European Union copyright legislation if it is its author’s own intellectual creation.[101] So here, again related to computer programs, the requirement for receiving copyright protection is the ”author’s own intellectual creation”. However, what is still left in the dark, is who would be assigned as an author in the case of computer-generated works, if there would exist the expression of ”author’s own intellectual creation.”

This case has been chosen for the thesis, because it handles the authorship of computer generated works. There still exists a clearly a situation where it is not completely certain how copyright and authorship function in relation to computer programs. We are stuck with the question of ”intellectual creation”. This is especially entertaining, considering our everyday lives are filled with ”smart” appliances, such as phones, light systems at home, route applications… Most of the computer programs or computer related functions we utilize today are considered smart, and as different levels of artificial intelligence, only the level of ”smartness” varies. Here we have a practical example of graphic user interface that can be protected under copyright legislation, if it is its author’s own intellectual creation. How do we determine intellectual creation? When thinking of a fictional example of a software that autonomously would design graphic user interfaces, the software developer would have made the required organizing for the work to happen, but on the other hand, the developer would not know how the finished work that the program produces would look like. So in practice the program would be the one creating the graphic user interfaces, and not the developer of the program. Could such graphic user interface be protected by copyright? If it was

[100] Court Decision, 14.10.2010, Bezpečnostní softwarová asociace – Svaz softwarové ochrany v. Ministerstvo kultury, C−393/09, EU:C:2010:611 point 1

[101] *ibid.* para. 46

created by a natural person, the answer would obviously be affirmative, but when the design work has been conducted and completed by a computer, then the answer is not as clear anymore.

Here we notice, that the question of allocating authorship of computer generated works is not relevant merely because of a psychologically rewarding feeling for the natural person who could be the author, but also because this type of legal culture could either incentivize in developing ways to utilize artificial intelligence in performing task more efficiently than humans do, in which case there would exist economic gains to be expected and regulated upon, or if the legal culture and existing interpretation of the current legislation is hindering the technological development because the developers would be too worried of potentially losing royalties and licensing fees from the developed graphic user interfaces (or any other end products that could be considered as ”works” in the sense of copyright legislation) if they could not be protected by copyright, if they were not created by a natural person.

4.7. Naruto v. Slater 15-cv-04324-WHO (2018)

The case concerns so called ”monkey selfies” where Naruto, a six year old macaque had taken selfie style photos of himself using the photographers camera.[102] The main question of the case was, whether or not the monkey as a relatively smart animal, would be the copyright owner and the author of the photos it had expressed its own creativity in. Entertainingly it was argued in the judgement, that” if Congress and the President intended to take the extraordinary step of authorizing animals as well as people and legal entities to sue, they could, and should, have said so plainly.”[103]
The result of the case was, that photographer Mr. Slater won the case, as it was deemed that an animal is not a natural nor a legal person, and thus cannot be considered as an author under the Copyright Act.[104]

This case has been a trendy topic in the legal sphere lately, also because it has risen such a high amount of media interest due to the rather absurd sounding situation. The relevance of the case in connection with the topic of authorship under major jurisdictions, that it could be also applied to future cases concerning computer generated works.

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[102] United States District Court Northern district of California, 15-cv-04324-WHO (2018) *Naruto v. Slater*

[103] *ibid.* page 5 lines 2-4

[104] *ibid.* p. 6 lines 16-22

The major concern in the case is, that even if with common sense and based on the general knowledge on animals and especially monkeys, it is well known that monkeys are smart and intellectually capable animals, enough so that they have created paintings and tools for usage, it is completely another question if those paintings or tools could have copyright or be patented. the reason for the judgement in favor of Mr. slater can be seen, as it would change the legal field significantly to grant a monkey, that is not a natural person, ie. human or a legal person, ie. a company authorship of the work and thus all the rights included within copyright as well.

If the logic of this judgement would be applied to computer generated works, considering that the circumstances are relatively similar, as we are well aware, that it is possible to program a computer to do incredible things independently without continuous human input, as a computer or computer software is not a natural or a legal person either, the computer would not have gained authorship or copyrights under this judgement either. Theoretically it is possible to legally hold a monkey and a computer as equals, both are able for creating works, but for the current legal culture it is easies to not grant copyrights for either the monkey or to the computer, but for the owner of the computer and for the owner of the camera. the case could have been even more fascinating if Naruto the money was owned by a natural person, who would be considered as the proprietor of the copyrights, the owner of the creative monkey, or the owner of the camera that the photos were taken with?

5. COPYRIGHT AND AUTHORSHIP BY ARTIFICIAL INTELLIGENCE IN EU AND US - A POSSIBILITY FOR CO-OPERATION?

In the international environment we are living in today, it would make sense to co-operate also in the field of copyright at least between European Union and United States of America. Currently most innovations are happening in the famous Silicon Valley in United States, due to differences in legal environment for technology research and design. Through this type of international co-operation, European Union could potentially catch up United States in the race for new Artificial Intelligence fueled technologies, and turn into a considerable competitor on the market. Another scenario is, that as nowadays, and most likely also in the foreseeable future as well, everything, also copyright protected products are located more and more on the internet, potentially European Union and United States could co-operate when it comes to the type of protection or liability a copyright protected product could be covered by online. As we know, most products, such as for example Google, Facebook or Apple's cloud storage services are located in the cloud, and with slight regional legal adaptations available across the globe. So in that sense it would also make sense to at least in the field of copyrights, and the obligations related with ownership (however, the property right may be assigned) to be enforced similarly in the two major markets for those products, European Union and United States.

Based on academic literature, there exists a certain difference in the legal cultures between the European Union and the United States in regards of copyright, and for example where the European Union copyright Directive was rather well received in Europe, in the United States around the same the Digital Millennium Copyright Act of 1998 was considered to be favoring mainly the copyright owners and authors of those works, ruling out, or at least making significantly more challenging to use copyright protected works for the purposes of Fair use that has been traditionally used in the United States[105]. Most likely the greatest difference in the reception of the two legislations was, that even if in the European Union Copyright Directive there are exceptions for the usage of works for the public benefit, such as for the purposes of education, and all of those exclusions are not mandatory, but for the nation state to decide if they want to implement all the exclusions or not, it is still mostly common for the European Union Member States to implement the full content of the

[105] May, C., (2007) *Digital Rights Management, The Problem of Expanding Ownership Rights* - Oxford, Chandos Publishing, p. 52

Directives that have been issued, and thus such significant favoring of the private property rights on price of public benefit does not happen in the same way in the European Union, and thus it might explain why it has been easier for the general public to agree on the European Copyright Directive.

In his Article Griffin compares legislation on digital copyright, from the US Digital Millennium Copyright Act from 1998 and from the EU a Directive on the harmonization of certain aspects of copyright and related rights in the information society from 2001.[106] However, unfortunately even his comparison of those two legal instruments of the digital era for the starting new millennia did not really see the possibility of non-human author as a very close by issue, and the question of the nature of non-human authorship has not been assigned to in the laws.

Interestingly enough, the main provisions of the copyright law in both areas, in the United States, as well as in the European Union are both to a certain extent based on the Berne Convention. As a good example of this, North American Free Trade Agreement (NAFTA) requires the protection of computer programs as literary works under copyright based on Berne Convention[107] Art. 1705 paragraph 1. This is interesting when thinking of the fact, that especially in the US it has been possible to acquire so called ”software patents” but then in the international agreements they want to deal with the issue through copyright legislation. This rises the question if the United States could potentially have some level of internal incoherence on the means and instruments they would want to use in terms of protection of Artificially Intelligent softwares, or if they potentially would want to keep their options open in the legal field based on convenience of having several instruments to choose from? In the European Union the difference between copyright and patents for Artificially Intelligent software, or in terms of any software, are more streamlined as it is a relatively clear process, that as the guiding principle all software will be protected by copyright as literary works, unless the software as a whole or in part has some type of novel innovation that could qualify for patent protection, which would be assessed on a case by case basis. So here there most definitely exists a slight difference between the European union and the United States in terms of protection of AI software, and the slight incoherence with the issue could potentially even be a helping factor if considering potential future wish of mutual harmonization in order of incentivizing

[106] Griffin (2005) *supra nota* 12 p.146

[107] International Treaties on Intellectual Property (1997) Ed. Leaffer, M.A. 2nd Edition, Washington D.C, The Bureau of National Affairs, BNA Books. p. 644

the increase of moving technologies, technological research, development design and usage easier across the Atlantic.

To give examples of the European views on the issue, and to demonstrate that the issue is not clear even inside the European Union, we have the following examples of different member states' national legislations: Article 5 of the Spanish copyright law expressly states that the author of a copyright protected work shall be a natural person.[108] When it comes to the German copyright legislation, based on Article 7 it would give some hope, when it is stated that author is the creator of the work[109], but then later in Article 11[110] there is a very strong implication of the expected author of being a natural person with statement of copyright protecting the author in his intellectual and personal relationships to the work. Interestingly enough, in the Finnish copyright law there is no definition of the nature of the author, other than being the "creator" of the artistic work.[111] Additionally in the Finnish Copyright Act as an author is deemed "that" entity that's name or commonly known pseudonym is being either attached to the work, or expressed when the work is being made available to the public. However, there does not exist any reference to the nature or quality of the "creator" and "that (entity)" of the author.[112] So interestingly, in the Finnish Copyright Act (Tekijänoikeuslaki) even if there is a strong implication that an author would be a natural person, it is nowhere expressly stated that that author must be a natural person.

Based on the examples presented above, we can deduce that when it comes to the definition of author even in the European Union Member States national laws are practically not harmonized at all, as each national law seems to be giving a rather different answer for a definition within the broad framework. So perhaps the first step in order for co-operation of any kind, would be that firstly European Union would harmonize the definition of author. It is very difficult to otherwise conduct co-operation over seas in the field as a competent international body, if there is no clear internal definition of author in European Union. Even if in United Kingdom CPDA computer generated works have been described and defined in the legislation, however it is not the same through the whole European Union the level of national legislation.

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[108] Real Decreto Legislativo la Ley de Propiedad Intelectual 12.04.1996 Art. 5.1.

[109] Act on Copyright and Related Rights (Urheberrechtsgesetz, UrhG) Art. 7

[110] Act on Copyright and Related Rights (Urheberrechtsgesetz, UrhG) Art. 11

[111] Tekijänoikeuslaki 8.7.1961/404 §1

[112] Tekijänoikeuslaki 8.7.1961/404 §7

Closest to the European standard for the definition of authorship or originality gets the Infopaq case, that is being presented above in the previous chapter on case law. This case could potentially serve as a good starting point for European Union's internal harmonization of the definition of author. Considering, that the definitions for an author across European union Member States based on the examples above are relatively similar, but still slightly different in terms of wording, it could be considered, that harmonizing the definitions through European Union directive or regulatory powers, would also not tamper too much with each country's national legislation, thus assumably avoiding a risk of causing controversy or opposition on the national level.

Additionally if we study the attempts to harmonize the European Copyright's definition of authorship, the preamble to the Copyright Term directive, as Guadamuz points out, defines an original work with "author's own intellectual creation reflecting his personality",[113] so even the European Union attempt to harmonize the definition of author actually indicates very strongly that we are here talking about a natural person, and in order to recognize computer generated works there would be a need to actually either really make very interpretative judgements based on the existing directive, or perhaps even draft an amendment to the Directive.

When it comes to the United States, they have been described as "the motherland of computer network technology", and thus their judicial system, courts and scholars have been the first in line in studying and making attempts to determine how to approach the matters on computer technology related legislation as anything new comes up, and the government is very supportive of such innovation related work with cutting edge technology.[114] Even if the book written by Makeen on the topic is old, the message still stands rather strongly, as United States is still a more favorable location to conduct technological research in the field of artificial intelligence employing emerging technologies than the European Union, potentially partially because of cultural reasons, United States has the framework for that type of research and design already in place, whereas the European Union is still trying to catch up.

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[113] Guadamuz (2017) *supra nota* 22 p. 180

[114] Makeen, M. F., (2000), *Copyright in a Global Information Society - The Scope of Copyright Protection Under International, US, UK and French Law* - London, Centre of European Law King's College London, Kluwer Law International p. 303

In his article Guadamuz assumes, that whether or not, for example a computer generated image will have a copyright in itself, will most likely be in the future resolved in the EU on a case-by-case basis.[115] The question of computer generated images is a fascinating one. The person who creates the computer program is considered as the author of the computer program, and based on the current legal culture, the same person is also the author of the work created by the program, even if the author theirself does not have the faintest idea of how the end result will be created or what it will look like, as the computer program is autonomously making the decisions. For the time being, there do not exist court cases to solve this type of question of authorship from the United States courts either. So, if looking at copyright from the point of view of this thesis, basing obligations and liabilities on ownership that is based on authorship, Neither of the two, European Union or the United States does not have clear answers yet, and the field is mostly for legal theorists to quarrel among each other from more philosophical and practical points of views. However, because the question has been posed, and it is out there in the open, it would be equally interesting and important to have clear answers.

In his article Guadamuz also gives light on the situation with copyright and definition of author in the United States. When it comes to the United States approach to the matter, there exists a famous case, Feist Publications v. Rural Telephone Service, about phone directory and its originality in relation to which the United Courts Supreme Court has commented "100 uncopyrightable facts do not magically change their status when gathered together in one place" whereas with the protection of databases by copyright the European Union is doing the exact opposite. So, in the United States, there is a rather established view as well of a natural person as an author.

Also United States Copyright Office has a rule about (voluntary) registration copyright, so that the copyright can be enforced if needed. For the registration of authorship of an original work, the work will need to be created by a human.[116] So, it is not difficult to say that this type of approach is not exactly very favorable of computer generated works.

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[115] Guadamuz (2017) *supra nota* 22 p. 179

[116] Copyright Basics - Copyright Registration, U.S. Copyright Office, https://www.copyright.gov/circs/circ01.pdf

Additionally from the point of view of the European Union, rather often in the harmonization of national laws in the field of copyright, the principle of territoriality is left untouched,[117] which has previously cause troubles with for example online video streaming services, but could also raise an issue inside European Union on the harmonization of legislation on the topic of Artificial Intelligence as an author or in terms of its liability as well. Especially different levels of harmonization inside EU on the field would result inning problematic, if there would for example exist a self driving car, but it could not be driven for example from Estonia to Latvia or to Finland, merely because of differences in the levels or forms of implementation of the directives by the local governance. So these types of issues would ought to be resolved before aiming for the type of cross-Atlantic co-operation in order to put in place a functional and mutually beneficial system.

When looking at the possibility of legal co-operation in the field of accepting artificial intelligence as an author both in the United States an in the European Union, in order to create such co-operation and to make it a functional and a beneficial one, as described by Shi, the manner of legal imposition and transplantation are in the key position in determining if such project would be successful or not,[118] as if the attitude towards the new law would be passive, also it's practical enforcement might be approached in a passive and slightly resistant manner, which naturally would not be a wished outcome when talking about a voluntary legal co-operation in order to gain technological benefits.

However, the difficulty with giving or not giving machines copyright based on the quality and creativity of the work, does not really resolve the greater societal issue, of how could a machine own and utilize a copyright?

Also there currently exists a rather interesting question regarding a combination point of not giving copyright protection to computer generated works, but giving copyright protection for databases based on the investment that has gone into the creation of the database, as there are already in existence databases created by artificial intelligence, such as Spotify, Youtube or Netflix recommendations for what to listen to or what to watch next, which are based in the user's previous history and erosional preferences and interests that have come out as a part of the previous usage of

[117] Kur, A., Dreier, T., (2013) *European Intellectual Property Law, Text, Cases & Materials* - Cheltenham, UK, Edward Elgar Publishing Inc. p. 245

[118] Shi W., (2008) *Intellectual Property in The Global Trading System, EU-China Perspective* - Berlin, Springer p. 285

the services or the websites. So, do the before mentioned companies own the copyright to those databases, when a human has not been creating those personal recommendations, but the recommendations for each user have been created by an algorithm. In the current system, in Europe, the only places where it would be possible to receive copyright protection for these databases would be in the United Kingdom, as pointed out by Guadamuz.[119]

In order to see international co-operation in the field of copyright and especially on the topic of artificial intelligence as an author, it would be required, that the EU would first have a unified and harmonized conception of the nature of the author, and that in the United States there would exist at least some initial signs of willingness to change the definition of authorship to include also non-human created works. Theoretically anything is possible with enough time, but in the current state, the author sees that any type of co-operation in this field would be unlikely in the next few upcoming years.

[119] Guadamuz (2017) *supra nota* 22 p. 185

6. POTENTIAL FURTHER DEVELOPMENTS

One type of reasoning in regards of legislation and its relationship with artificial intelligence in general, is that technology disrupts law only because of the way the law is structured.[120] So, from this type of view point it could be argued, that one potential future development would be changing the way of structuring law at least in relation to artificial intelligence and copyright protection and on the definition of authorship and thus also liabilities arising from artificial intelligence based technologies and the automated decisions the programs are making on any given topic, that could also potentially have significant impacts in the tangible ”real” world.

It has been a hot topic among scholars how is the liability for medical malpractice allocated if an AI system such as Watson by IBM has been part of making the decisions relating to the treatment of the patient. However, it is a rather entertaining, that there has been written far less about the liability of lawyers if they utilize artificial intelligence systems as a part of their work, and fail in a project due to an unforeseeable malfunction than there is written about doctors.[121] This type of question is important to present, as law, among all other professional fields will be affected by artificial intelligence in the future, and especially lawyers ought to be the ones to think of the liability issues related to the usage of artificial intelligence, it’s strengths and potential shortcomings. Another thing we ought to also consider in the future is the differentiation of artificial intelligence linked professional and private liabilities, because in its own way, it is a very different thing if a person on their free time crashes a self driving car due to a malfunction, compared to a situation of if a doctor or lawyer comes to the wrong conclusion of the situation after having relied on artificial intelligence too much, not taking to account the fact that not one single system created by humans is 100% perfect and free of errors or malfunctions.

And as for the time being there does not exist any exact legal regulation surrounding this topic, there is a need to both acknowledge the vast opportunities this technology provides us as legal professionals, but also perhaps still act cautiously in case anything goes wrong. Unless there exists a strong wish to see one’s name on the cover page of a case of a lifetime, about finally going to court

[120] Kaminski, M. E. (2017). Authorship, disrupted: Ai authors in copyright and first amendment law - *U.C. Davis Law Review* vol. 51 issue 2, 589-616 p. 591

[121] O'Donnell, J. (1990). Artificial intelligence use in the legal profession: What are its liabilities - *Software Law Journal* vol. 4 issue 1, 77-92. p. 92

in order to find an answer to the questions about liability of an artificially intelligent system and the computer generated works created autonomously by it, based on the user input.

Around the subject there exists a vast amount further questions and many of them are shared with all types of intellectual property and artificial intelligence, for example who is going to be responsible if Artificial intelligence infringes someone's copyright?[122] Or going back to the beginning, who is entitled to the income that is gained form the copyright protectable things created by the Artificial intelligence?

For an email interview the author of the thesis reached a representative of a Finnish non-governmental organization working in the field of copyright protection. The licensing manager of Kopiosto (an organization that deals with the copyrights of human authors producing audiovisual, photographic, and literary works), Kirsi Salmela had the time to answer the email interview on the topic of future developments of copyright in relation to Artificial Intelligence.[123] The views presented below are not representing the organization, but are solely the interviewee's personal views on the topic.

The answer to the interview question of how the interviewee believes that Artificial Intelligence will affect copyright protection in the future, was that it is self-evident that also in the Finnish legal practice there will come a point in time when the question will need to be thought of, if works created using Artificial Intelligence could potentially receive some type of a protection, and if so, what type of a protection. However, Salmela does not believe that this would have a major impact on the basic principles of copyright protection in its essence. The next question was if the interviewee sees potential threats or opportunities for the currently existing copyright legislation being created by computer generated works. In Salmela's view, works created by using Artificial Intelligence are not posing a threat for the rights of the human authors.

The third question posed in the interview was, that in the opinion of the interviewee, who ought to be the legal author of a computer generated work. In Salmela's view, the core question when approaching the issue is, how the requirement of originality affects the threshold of defining an

[122] Ravid, S.; Liu, X. (2018) When artificial intelligence systems produce inventions: An alternative model for patent law at the 3a era - *Cardozo Law Review* vol. 39 issue 6, 2215-2264. p. 2263

[123] Salmela, Kirsi, Licensing Manager of Kopiosto ry. On Copyright and Artificial Intelligence. Author's interview via email. 16 April 2019.

intellectual creation. It is well recognized, that originality is defined as being linked with the creativity as well as the personal and original choices made by the author of a work. When looking at the issue from this point of view, a computer generated work would not fulfill the requirement of originality, and could thus not be classified as a work belonging to the scope of copyright protection. However, with computer generated works there are several factors that are similar to databases being protected in the European Union by the Database Directive, and based on that, it could be potentially possible to consider a certain type of a *sui generis* protection, or a related right form of protection for computer generated works in the future.

Potential ways to solve the issues that are currently being faced by the legal field on the topic of artificial intelligence and liability could be; Firstly, either protecting computer generated works produced by utilizing Artificial Intelligence in a similar manner as databases are currently protected in the European Union, but also completely waiving the concept of author in relation to computer generated works. Secondly, another option could be granting artificial intelligence a certain type of legal personhood, in order to assign authorship to a ”person”, but still holding to the concept of author and to treat artificial intelligence and it’s creations like a worker and worker’s creations would be treated under an employment contract. If Artificial intelligence would be granted this type of a personhood and treatment, it would also solve the liability issue, when with a high likelihood it could be possible to apply vicarious liability to the situation. In this scenario with legal personhood there would most likely exist a need to limit the moral rights linked with authorship, but potentially it could also be seen as something that enforces the position of natural person authors and the soft aspects of creation that only a human could understand. The third option would be protecting computer generated works as works of joint authorship created in co-operation with the supervisor or supervisors of the process of the software, and the Artificially intelligent software. However, as described above, it would not necessarily be the most sensible legal solution to solve the issue through joint authorship, as there is very few if any factual real world ”joint” actions in the co-operation of a natural person and a computer program, so this could lead into inflation of the value of joint authorship, in addition which to the definition of joint authorship ought to be altered to include authors that are not natural persons, and if the artificially intelligent software would come to a solution that would be considered as ”wrong” or a ”malfunction”, as described above, the natural person who had practically nothing to do with the decision making would be potentially held liable for the decision, which is not an approach that would fit in the sense of justice of most people. The fourth possible approach on the topic completely disregards the question of authorship, but presents

that the liability in the cases of malfunctions with for example autonomous vehicles would be solved through product liability legislation, but as the author of this thesis sees the matter, that type of approach would hinder the development of these new technologies in the fear of facing legal issues, but additionally, as often the artificial intelligence uses the user's way of using the software and the machine as training data, a case of potential functioning that was not wished for, might even boil down to the user's previous actions and preferences artificial intelligence has based on those actions, and thus the user would be the reason for the ”malfunction” that would be a result of the machine performing and learning exactly as it has been instructed to do, in which case holding the manufacturer or software developers liable for a malfunction, that is not a malfunction, but a function of learning based on the user's preferences, which is essentially what the machine was supposed to do in the first place. So the responsibility of the user could not necessarily be completely ruled out either.

For the time being, we still need clarity when it comes to authorship, intellectual property ownership and through those questions also the matters of liability when it comes to artificial intelligence in the field of copyright legislation. It could be seen based on the above mentioned reasoning, that it would be potentially possible to leave the existing copyright legislation unchanged, and merely renew the legal culture around the topic, and just interpret the questions surrounding copyright and artificial intelligence in a way that would be suited to the modern environment. However, on the other hand it could be said, that both the legal community as well as the technology field would at the same time greatly benefit from explicit and more clear cut rules, that would have actually been written with the current situation in mind. So here, we will also need to balance, because the current legislation is not keeping up too well with the rapidly changing technology, but on the other hand, it more or less functions in real life situations when some interpretation is applied to the case. If the current legislation would be adapted in order to suit the current emerging technologies such as artificial intelligence better, the situation might possibly end up with the adapted legislation turning into something visibly old, and out of date within such a short period of time as for example 10 years, as the technology still keeps on improving very fast, but it would not be sensible to adapt the legislation on any given topic annually.

So even if the currently existing legislation was to be adapted in order to clarify the currently existing questions on topic of authorship, intellectual property ownership and the liability linked to

those rights, it would need to be done in a very elegant way, so that the adaptations and novel clarifications would also be able to stand the test of time.

CONCLUSION

The aim of the thesis is to give options and tools on how to proceed with developing the existing copyright legislation into a more modern version of its current self, in order to facilitate smoothly the new way of creation of works into a functional part of the legal framework of the future.

The research problem that has been presented in this thesis was if the existing legislation could keep up to the pace of the technological advancement, or should we start considering ways to improve the copyright legislation we have in order to facilitate for the technological change in tomorrow's society?

The conclusion to this problem is, that there are several differing standpoints on the topic, some believe that the existing copyright legislation will suffice for the requirements of the future, but the majority consider that something will need to be done in order to facilitate the new emerging technologies better, but the views on what would need to be done vary greatly. Based on the above presented research, the author believes, that there is a need to take a strong stance for the renewal of the legislation, as the currently existing legislation for the most parts does not even directly refer to a situation of artificial intelligence as an author, and thus leaves most regulation of the field up for the interpretation of the courts and administrative bodies, without providing a clear answer that would be equally accessible for everyone.

The first research question was, if we would need to adapt our existing copyright legislation to facilitate these technological advancements better, and more specifically, what is the impact of machines being the author *vis á vis* the current requirement of human being as an author of the copyrighted work? The hypothesis for the first research question was that, yes, the existing copyright legislation's requirements will need to adapt in order to facilitate computer generated works better, and granting machines authorship would mainly have a positive impact in securing economic rights related to copyright. However, as the issue is going to be studied further, there exists a possibility to find, that perhaps our existing legislation might be functional also in the future in administrating the matter.

The result for this research question is, that there exists a strong need to adapt the existing copyright legislation to facilitate artificial intelligence authorship better and through that assignment of authorship improve the accuracy of determining other legal matters related to the assignation of

authorship, such as liability issues. The currently existing legislation would not be easily adaptable for this type of legal environment of the future. The result for machines being considered as authors would require a novel type of legal person in the eyes of law, and it would require leaving the machines outside the sphere of being able to possess moral rights as a part of copyright. However, by giving the machines a copyright protection for the works that are being created, the regulatory system would be possible to provide future incentives to innovate, as there would exist clarity in the field of assignment of economic rights.

The second research question: How could those similarities and differences between European Union and United States copyright legislation regarding author and computer generated works be merged into an internationally unified or co-operative approach towards the legal issue of computer generated works? The second hypothesis is, that: -Yes, it is possible to reach a regulatory agreement between the EU and US, on the topic of authorship of computer generated works, as currently there exists something that could be described as a legal void in the field, and all the existing legislation is based on an earlier and different stage of technological advancement, which in itself helps the creation of shared regulation when both parties can start from a clean table with the subject matter being regulated.

Based on the research, co-operation in the field of copyright legislation in terms of artificially intelligent author would be a beautiful idea on paper, but considering the fact that even the European Union has not been able to internally harmonize the definition of an author, this development is not expected to happen soon, if ever. Additionally the United States has a rather strong practical ruling of the fact that only a human being can be considered an author, and thus there does not exist a void as suggested in the hypothesis, but rather a categoric refusal to accept a computer being the author in computer generated works. The author of the thesis likes to believe everything is possible with enough will power, but this type of co-operation would be a very slow one to start, and potentially not necessarily even too beneficial, unless it was implemented in a form of a single treaty for the purposes of incentivizing research and development in the field of technology. By this research the second hypothesis of ”legislative void” and the ease of international co-operation in the matter of artificial intelligence authorship in the field of copyright has been proven to be false.

Third research question was: In which manner could we create a legal vicarious effect between artificial intelligence and the natural or legal person functioning as its operator or owner, by using

the existing legal framework? The third hypothesis was, that by researching the existing legal framework it would be possible to present legal options for formatting future draft legislation about the rights and liabilities of natural and legal persons overseeing machine authorship, and thus computer generated works, in order to present viable options for practical legal solutions for creating an indirect liability between legal or natural persons and artificial intelligence that is creating works.

The research revealed that there exists several options for creating a liability relationship based on machine authorship, one would be going through traditional consumer protection legislation, but the author of the thesis is not considering this suggestion as the best one, as it would only clarify the situation from the point of consumers. Vicarious liability based on authorship, and ownership of the machine on the other hand could be an interesting one to research further, as it would distribute the liability better. However, from the point of view of paying damages for potential accidents, the discovered ways of assigning liability do not necessarily make a vast difference to the currently existing system even if they would be implemented. However, assigning liability in cases of computer generated works and decision making would be a fruitful area for further legal research.

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