

AI, Author and Copyright

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ABSTRACT:

Copyright is constantly being challenged by new technologies. For now, copyright has barely kept up with the constant changes. The very core idea of copyright, authorship, is now being tested by Artificial Intelligence and works created by Artificial Intelligence.

My research problems are mainly composed of authorship issues with Artificial Intelligence and issues with copyright ownership over works created by Artificial Intelligence. There are already artificial creators and more so in the future, so these copyright issues must be faced upfront and legislation should and must be adapted for the coming surge of artificial creators.

Currently Artificial Intelligence cannot be a legitimized author or own copyright to a work. This all leads back to legal personhood, which Artificial Intelligence lacks due to current legislation. Artificial Intelligence must be placed somewhere in the equation of copyright for copyright to work properly and to get some legal certainty on these issues.

KEYWORDS:

Artificial Intelligence, Authorship, Copyright, Ownership

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1. Introduction

Copyright is a part of a bigger group of rights. These rights are called intellectual property rights (IPR). IPR can then be divided into two main groups; 1) copyrights, which include for example the rights for writers, artists and composers for their works 2) industrial property right, which includes patents, trademarks and protection of designs. This partition is mainly due to two different conventions, the Paris Convention of 1883 and the Berne Convention of 1886.¹ Even if copyright differs from industrial property rights, they do share a common ground; exclusivity.² It should be noted that copyright legislation is actually to a large extent contract legislation and furthermore copyright laws are mainly dispositive law and therefore parties can in theory settle their rights and obligations as they see fit. This freedom of contract can be limited by external legislation like competition legislation, mainly due to the fact that exclusive rights shall not lead to a dominant position in the market.³

Copyright is an important part of the common economy and Copyright has in fact protected works with author for almost three centuries. Who would write books, compose music or code new computer programs if those works could not get any protection against copying, distribution, modification and usage, just to name a few. A study made in the United States of America in 1954 claimed that copyright industry generated 2% of the GDP in America and in 2001 it had doubled to 5,2%.⁴ Copyright, as the word says is plainly a right to exclusively copy ones work. The dictionary definition of copyright is as follows:

¹ Immateriaalioikeus, p. 2

² Tekijänoikeus, p. 1

³ Tekijänoikeus, p.4-5

⁴ Tekijänoikeus ja lähioikeudet, p.15-16

*“The exclusive and assignable right, given to the originator for a fixed number of years, to print, publish, perform, film, or record literary, artistic, or musical material.”*⁵

Copyright is an incentive for authors to create new as are all the intellectual property rights.

As everything in this world, nothing is set in stone and everything is open for criticism. IPR's too have received their fair deal of criticism. The most usual claim is that IPR's are too strong and too extensive.⁶ In these cases copyright might be called as an unbearable copyright, since copyright is extending to new areas and therefore new users on these areas must also pay for using works under copyright. The further copyright has evolved from its origins, the louder the voices of its users has become.⁷ A common justification for strong IPR's is usually traced back to the incentive to create new and innovate further.⁸ Parodies of well-known brands and support for open access are part of the criticism as well. Different pirate parties around the world can be seen as an embodiment of the dissatisfaction towards IPR's as well. Usually the criticism towards copyright concentrates on the copying as it is illegal even if the copy is for personal use only.⁹ One could even ask if all this criticism is derogating the credibility of IPR laws and legislation as a whole. The field of IPR has expanded further and in doing so, also fragmented. Expansion and fragmentation have eventually led up to complexity, and part of the criticism is based on that as the objects that are protected, is argued to be too extensive. The criticism has reached a point where it cannot be ignored easily and so IPRs must go on and evolve. In the end the basis for IPRs is the protection of individuals creativity.¹⁰ The common good should not be forgotten, as it is the counterpart for the good of individuals and together they

⁵ <https://en.oxforddictionaries.com/definition/copyright>

⁶ Immateriaalioikeus ja yleinen etu, p. 2

⁷ Tekijänoikeus ja lähioikeudet, p. 13

⁸ Juridiikan perusteet. p. 505

⁹ See for example the Finnish Pirate Party or the Pirate Party of Sweden and their political themes

¹⁰ Immateriaalioikeus ja yleinen etu, p.2

form a balance of interests.¹¹ This balance between common good and creators is crucial for the role of IPR's in the information society has increased.¹²

As technologies evolve in an ever-accelerating pace the legislation around them should keep up, but how could it? It is widely agreed upon that IPR legislation should remain technology neutral. This mindset is crucial for bringing the copyright among other IPRs to the 21st century. Technology neutrality is the only way to govern new and arising technologies at least to some extent. Digital environment has already shaped the world in multiple ways and IPR's have a hard time to keep up. Using digital networks to spread material under copyright has created exponentially expanding market for immaterial goods. Creators are the most important party in the digital value chain and will remain so.¹³ On the contrary copyright has been challenged by new technologies before and it has to this day conquered those tribulations with average success¹⁴ and it has so far been successful in defending creativity.¹⁵ new wave of technological evolvment with AI might be IPR's biggest challenge to history, since before there were no rivals to claim the authorship over a created piece of work. One example of how off-guard this new technology has surprised the Copyright legislation comes from the U.S where the Copyright Law did not see any major adjustments to match the current state of the digital world except for a definition of computer program in the 1976 Act.¹⁶ Luckily times are changing and policy-makers around the world are acknowledging the challenges that AI provokes.

Later on the internationality of copyright will be discussed, but it is good to mention that copyright is an international branch of legislation; the goods that are protected by copyright are usually immaterial like a song or a computer game and

¹¹Immateriaalioikeus ja yleinen etu, p.6

¹² Juridiikan perusteet, p. 505

¹³ Tekijänoikeus ja Digitaalitalous, p.4

¹⁴ Copyright Legislation and Technological Change, p. 276

¹⁵ The State of Copyright: The Complex Relationship of Cultural Creation in a Globalized World, p. 4

¹⁶ H.R Rep. No. 94-1476, 54

therefore they can be spread around the world almost immediately. Material goods like metals, spices etc. do not have this feature. International copyright system was first built upon bilateral contracts, but it soon came evident that multilateral system would be necessary.¹⁷

1.1 Monkey-selfies



This is a picture that a macaque monkey took in 2011.¹⁸ A photographer named David Slater assembled his camera on a tripod and gave the remote trigger to monkeys and that resulted on a form of photographs, which Slater then named as "monkey selfies".¹⁹ These photos then became a question of copyright issues, which ultimately lead the United States Copyright Office to clarify its practices by stating that works created by non-humans are not subject to copyright and listed in

¹⁷ Tekijänoikeus ja lähioikeudet, p. 26

¹⁸https://upload.wikimedia.org/wikipedia/commons/4/4e/Macaca_nigra_self-portrait_large.jpg

¹⁹<http://www.bbc.com/news/world-asia-34346092>

its examples a photograph taken by a monkey.²⁰ Even if the whole idea behind the monkey selfie copyright dispute feels to be silly it nevertheless altered Copyright Offices practices, a merit on its own.

This copyright dispute between Slater and macaque monkey did not end on the dismissal of the case on January 28th 2016.²¹ The case was dismissed on the grounds that the copyright law does not extend its protection to animals as said by the US District Judge William Orrick III. Orrick's argument is as follows:

*“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”.*²²

Only a few months later People for the Ethical Treatment of Animals, PETA, appealed to the Ninth Circuit Court of Appeals. In 2017, the court held an oral argument on the matter in San Francisco.²³ So, the case which inspired me to write about copyright, artificial intelligence and how those two intertwine was still going on during my writing process and on the conclusion part I shall lay out the outcome and its possible effects. I have a feeling that the ripples caused by this case are nowhere near of dying down.

1.2 Artificial Authors

The Advancement on the field of computers has been rapid and there seems to be no limit on the horizon. Computers and machines were only tools when they were first invented but today, they can basically do everything we humans do. If you

²⁰Compendium of U.S copyright office practises, section 313.2

²¹ <https://casetext.com/case/naruto-v-slater>

²² Environmental Law, p. 41

²³ <https://law.justia.com/cases/federal/appellate-courts/ca9/16-15469/16-15469-2018-04-23.html>

search the Google you can find different kind of art produced by algorithms (AI) and there has even been a machine that has produced inventions, which are then patented²⁴ and furthermore these computers can, under certain circumstances, qualify as an inventor, a phenomenon that Ryan Abbott refers to as computational invention.²⁵ With the ever-growing state of artificial intelligence there are also many problems and issues that arise with it. The before-mentioned example of Naruto shows that copyright issues can arise with animals but what is the case when the one taking the picture was AI or what happens when AI is the author of a book?

Normally the copyright is given to the author of the work like a writer.²⁶ In those cases the authorship is quite clear and there is no dispute about whether a copyrightable work has been made. Adding AI to the mix and replacing human with AI raises a lot of problems. Now, the main issue of this thesis is the question whether a work made by artificial intelligence is copyrightable or not and who owns the copyright to such a work. Two categories of AI-created works can be thought here: One where the AI is only used as a tool, as means to an end, and with direct input of a human and second where works are created autonomously by AI without any direct human input, besides the source code that created the given AI. This thesis addresses mainly the second category where there is no direct input from human being and works are created by an AI autonomously. This choice is made upon my personal opinion about AI as something more than a tool and the fact that if AI is assumed to be just a tool, there does not seem to be any problem with copyright or authorship in the first place. Taking the approach of an autonomous AI creating works, we are able to delve deep into the various legal issues emerging from this approach. This assumption creates the basis for this whole thesis.²⁷

²⁴https://motherboard.vice.com/en_us/article/these-artworks-were-made-by-algorithms,
<http://www.popsci.com/scitech/article/2006-04/john-koza-has-built-invention-machine>

²⁵ I Think, Therefore I Invent: Creative Computers and the Future of Patent Law, p. 1080

²⁶ Copyright Acts usually state as follows: "a person who has created a work shall have the copyright". Look for example the Copyright Act of Finland or the Copyright Law of the United States of America

²⁷ This set of categories is also used in Kalin Hristov's article Artificial Intelligence and the Copyright Dilemma, where both of these categories are explained and researched.

On the other hand lawmakers could have not anticipated such a problem to arise in the future and copyright laws, like laws altogether, around the world are made for humans, even if it is not plainly written, the assumption of a human involvement is always there. This assumption must now be questioned and researched properly in order to find answers for this thesis' problems. Like James Grimmelman wrote in his article, Copyright for Literate Robots, the copyright legislation has concluded almost like by accident that it is only for humans. His article is mainly about reading done by computers and the possible infringement done in the process, but nevertheless he has a point.²⁸ One could ignore these questions by stating that artificial intelligence is just a machine and thereby it can only be viewed as a tool to help humans create and work. Well that could be an easy answer, but it gets more complicated when there is no human action included in the process that leads to a work e.g. a song or a book. The AI has to be created first but besides that, it could work alone. Like humans, AI cannot be created out of thin air so coding or creating an AI could be considered to be mutual with the birth of a human being. Now, this is just a simplified thought-pattern, but you can get the idea that why would copyrights be only limited for humans and why would humans get the credit for something they have not done? These ideas are quite pro-futuristic, but these questions will be more pressing in the future, I dare to say.

My thesis problem might seem a bit niche among other copyright related problems like the extensiveness of copyright²⁹ or pricing of copyrighted works among music industry³⁰, but with the rapid evolvement of technology we might see an enormous amount of AI created works in the next decade and these problems will keep emerging again and again, so therefore it is crucial that researches like my thesis are written.

Copyright and intellectual property rights in general are not the only branch of our legislative system that needs to be revised and modernized at the wake of AI and digitalization. Self-driving cars, smart contracts and bitcoin, these are only few

²⁸Copyright for Literate Robots, p. 1

²⁹ How to fix Copyright, p.9

³⁰ How to fix Copyright, p.10

examples that will revolutionize our everyday life, and yet there are no laws telling us what to do with these inventions.

1.3 Contents of the thesis

The contents of this thesis will focus on the issues with authorship and artificial intelligence and go through the current legislation of copyright. I have already introduced my research problem in this chapter, but I will go through rest of the contents briefly and explain my approach and research methodology as well. The second chapter explores the history of AI and computers briefly before trying to find a suitable definition for AI.

Chapter three will explain the copyright legislation of the European Union, the United States of America and Finland in order to find the answer to these my research problem. I will also enclose cases from different legal systems in order to establish some sense on what legal ground authorship is based. This chapter also researches authorship on these different legislations and answers the question whether AI can indeed be an author to a created work.

Chapter four along chapter three are the crucial chapters for this thesis. Firstly, I research authorship problems with works created by AI and in chapter four this thesis explores the different possibilities of ownership for such works.

In the last chapter I am going to summarize the whole thesis and the key aspects of my findings and also present my own opinions and thoughts on the matter of AI as an author compared to the current legislation of the European Union and the United States of America and that of Finland.

1.4 Approach and research methodology

Dan L. Burk has said that Copyright law keeps on fascinating scholars nearly endlessly because of its paradoxes and even absurdities.³¹ So how these paradoxes and absurdities could be researched effectively? The problem of AI created works in the scope of Copyright can be answered explicitly by researching the current legislation and past case law of Copyright and therefore I have taken a legal approach of Copyright and authorship on this thesis and I am going to examine all the crucial aspects of Copyright and authorship in order to establish a satisfying conclusion for my research problem. Copyright has an immense economical value, but I will not dwell too deep on that side of the matter, but rather point out the economic impact of copyright in information society. I might have used different approaches as well like critical cultural approach to law, since Copyright is deeply embedded with culture, but I chose to exclude non-legal approaches in order to create a coherent and clear thesis inside the strict confines of legal field.

Usually the most obvious choice for a legal thesis is to use legal dogmatic method or jurisprudence for legal research. Legal dogmatic method is a research method that concentrates on the existing legislation, systemizing and interpreting it.³² Legal-dogmatic method also interprets the legal principles and norms of the given field of law. The existing legislation is the main source of references in this thesis and therefore it is practical to use legal dogmatic method. Legal dogmatic method can be divided into two different categories; practical and theoretical.³³ Both of these are used in my thesis; theoretical scope in order to ponder and explain the nature of copyright and research current legislation and practical scope to research caselaw in order to reach a conclusion. I use caselaw from three different legislations on this thesis in order to find similarities and differences on the approaches different courts have taken on Copyright and authorship issues and to establish the basis of authorship and ownership of AI created works on these legislations.

³¹ Method and Madness in Copyright Law, p. 587

³² Mitkä metodit? Opas Oikeustieteen metodologiaan, p. 21

³³ Oikeussäännösten systematisointi ja tulkinta, p. 36-37

My personal approach on this could be described as pro-AI, as I would see the full potential of AI to be harnessed and the current legislation to be reformed in favour of current and coming technology. My opinions are well stated out on the pages of this thesis, but still I am not blinded by them and the thesis problem is addressed properly and as unbiased as possible.

The theoretical framework for my thesis consists of European, Finnish and the United States of Americas copyright and IPR laws. I have researched the key laws of Copyright in of the aforementioned countries and Unions. My sources are mainly of legal background, but also some economic and technological as well. Focus is on the legal sources but my research problem is so intertwined with economy and technology so they cannot be excluded fully.

2. Deus ex Machina

“Let an ultra-intelligent machine be defined as a machine that can far surpass all the intellectual activities of any man however clever. Since the design of machines is one of these intellectual activities, an ultra-intelligent machine could design even better machines; there would then unquestionably be an ‘intelligence explosion’, and the intelligence of man would be left far behind. Thus the first ultra-intelligent machine is the last invention that man need ever make, provided that the machine is docile enough to tell us how to keep it under control. It is curious that this point is made so seldom outside of science fiction. It is sometimes worthwhile to take science fiction seriously.” – Irving John Good³⁴

Irving John Good was one of the first to address the possible problem with intelligent or as he said ultra-intelligent machines, in other words AI. Science fiction has always entertained the idea of intelligent machines rising against humans and eventually exterminating humankind. Good is not the only one who has warned us about AI, the list includes also Stephen Hawking, Bill Gates and Elon Musk.³⁵ Although Elon Musk is one of the greatest technology positive humans of our time, AI seems to bother him greatly. In the book *Elon Musk – How the billionaire CEO of SpaceX and Tesla Is Shaping Our Future* Musk talks about his fear of an army of intelligence robots that could destroy the whole human race. He fears that Larry Page, the co-founder of Google is the one creating such an army. Musk says that where Page is compassionate, he himself is not so optimistic.³⁶

Our image of AI has formed mostly by science fiction films and books and that is why we might not even consider the possibility of them existing right now, right

³⁴ *Speculations Concerning the First Ultra-Intelligent Machine*, p. 33

³⁵ <https://aeon.co/essays/true-ai-is-both-logically-possible-and-utterly-implausible>

³⁶ *How the Billionaire CEO of Space and Tesla Is Shaping Our Future*

here and aiding us in our everyday life. The abovementioned fear of intelligent machines can also be traced back to science fiction and partly it is only wise to keep the worst-case scenario in mind when creating new technology. Therefore, it's crucial for this thesis to try to define what AI is.

This chapter explores the history of AI and computers altogether briefly. When we have studied the history of AI, I am going to present various definitions of AI and try to come up with a general definition of AI. I must point out that there has not been any single definition that we could take as the ultimate truth.³⁷

2.1 History of computers and Artificial Intelligence

“Every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it” – John McCarthy³⁸

The word computer is derived from Latin, as are so many other words. The Latin word *putare* means to think and *computare* means to calculate.³⁹ Thinking and calculating, two words that describe, what a computer does; first of all it calculates since the programs behind any computer are basically just ones and zeroes and computational capacity is one way to measure how good the given computer is, secondly one could say that computers think via this computation.

The term Artificial Intelligence (AI) saw the light in 1956 when John McCarthy held the first academic conference about AI at Dartmouth College in New Hampshire. The scientific study on AI started there at Dartmouth after the conference and those who participated in it, became the leading experts on the field of AI. In fact AI as an idea is much older than we might think. Philosophers

³⁷ Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies, p. 359

³⁸ A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence

³⁹ <https://latin-dictionary.net/search/latin/putare> and <https://latin-dictionary.net/search/latin/computare>

of ancient Greek thought of machine men and artificial beings. Aristotle wrote in his book, The Politics:

*“For suppose that every tool we had could perform its task, either our bidding or itself perceiving the need...”*⁴⁰

Leonardo da Vinci was among other things an inventor and like many inventors in the history, a way ahead of his time. Vinci invented blueprints for e.g. helicopters, tanks and automated-knight. So, even the great da Vinci dreamed of a robot, automated machine that could move and do various thing on its own, of course da Vinci could not build such a machine, given the time he lived in.⁴¹

John McCarthy was already mentioned at the start of this chapter as the founder of the term AI. McCarthy’s input for modern AI cannot be underestimated. The evolution of computers and computer science in the 20th century ultimately led to the birth of AI as we know it today. Although AI is not yet intelligent, in a way we human are, the advancement has been rabid and some scientist believe that we will witness the birth of true artificial intelligence in the next decades of the 21th century.⁴²

Science fiction continued the fiction of AI and robots and brought those concepts to 20th and 21st century. One of the biggest names of science fiction is undoubtedly Isaac Asimov who wrote the book I, Robot. In his book Asimov introduced three fictional laws called the Three laws of Robotics, to which I am going to return later in this thesis. Humans have always tried to create life or at least dreamt about it and now at the dawn of digital age, we are closer than ever creating artificial and intelligent life.

⁴⁰ The Politics, p. 56

⁴¹ A Quest for Artificial Intelligence, p. 20-21

⁴² <http://dataconomy.com/2016/05/far-away-inventing-true/>

2.2 Definition of artificial intelligence

Now that I have gone briefly through the history of AI it is time to explain and research what AI even is. Artificial intelligence as a word tells much about what it is. It is artificial and some may even say unnatural. The problem with defining AI is not in the first part of the term but rather the latter part, intelligence. What is intelligence? Is it the way humans are, think, understand and how we are self-aware of our existence? These are profound questions and quite hard to answer in a way that would be short and absolute. In this thesis the basis is that intelligence is not reserved only for humans even if the definitions of intelligence usually tend to be derived from human characteristics.⁴³

There are many forms of intelligence and it can be thought as an infinite spectrum; at the moment we, the humans, represent the cutting edge of that spectrum whereas, for example, a snail falls to the other end of the given spectrum. Intelligence is like a house: one brick of the foundation could represent the core of intelligence, the basis of it and by adding more bricks, eventually walls, windows and ultimately furniture, the intelligence evolves and becomes more advanced as the imaginative house is being built. If the threshold for intelligence is based on our perception and understanding of intelligence, machines will never achieve it, nothing will. Even if we could copy human brain precisely the machine would only be a copy of human mind and intelligence, maybe intelligent but not by its own merits. One could even claim that humans cannot really think as so often the aftermath of our thinking only leads to suffering.

Usual definition of AI is as follows:

⁴³ Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies, p. 359

*“The science and engineering of imitating, extending and augmenting human intelligence through artificial means and techniques to make intelligent machines”.*⁴⁴

Usually intelligence is defined as an ability to produce complex results in a complex ever-changing environment.⁴⁵ The dictionary definition seems to support this definition. Intelligence is 1) Someone’s intelligence is their ability to understand and learn things 2) Intelligence is the ability to think and understand instead of doing things by instinct or automatically.⁴⁶ Thinking and intelligence can be seen as a biological data processing, in that sense our thinking does not differ that much from the computers. At its simplest form, the thinking process is only mechanical, instinctive and non-aware action.⁴⁷

Now continuing with the dictionary definition of intelligence, we have, the ability to learn and understand new things and doing these processes manually. The ability to understand and learn new things is something only we humans possess. Machines and animals can learn new things by teaching them, but they surely do not understand things in a way we human beings do. The second definition also rules animals out of the equation since animals react mainly by instinct rather than understanding really what is happening around them. Then the last part of the second definition, automatically, rules out machines. Machines do what they are built or coded to do; they react automatically. With this dictionary definition of intelligence, one could rule intelligence to be something only we humans possess. I would like to argue that this view is not everlasting. AI will eventually have the ability to understand things and the automatic response of machines will be something that only the outdated machines will have. The definition for intelligence can be altered and it can be reserved only for humans even in the future where AI has the ability to understand and learn things, but I surely hope that we are not that shortsighted.

⁴⁴Advanced Artificial Intelligence, p.1

⁴⁵Osaavatko koneet ajatella, p.7

⁴⁶Essential English Dictionary

⁴⁷Osaavatko koneet ajatella, p.7

Nils J. Nilsson defines intelligence as a quality that enables an entity to function appropriately and with foresight in its environment.⁴⁸ With this definition there are plenty of intelligent beings; animals function appropriately and with foresight in its environment, even some machines could be deemed intelligent with this definition.

One possible way of seeing the whole problem with intelligence and machines is to forget the whole concept of thinking, at least the way we humans think. Alan Turing suggested in *Computing Machinery and Intelligence* that we should not focus on the question: “Can machines think?” Turing then proposed that we should ask if machines could pass a behavioral test. This then led on to the famous test called the Turing Test.⁴⁹

2.2.1 Russell and Norvig on AI

In the book, *Artificial Intelligence, A Modern Approach*, Stuart J. Russell and Peter Norvig separate the definitions of AI based on either thought processes and reasoning or behavior. They then divide those definitions in the terms of human performance and ideal concept of intelligence. Therefore, they have four possible goals to pursue in artificial intelligence⁵⁰. I have included their figure here:

⁴⁸The Quest for Artificial Intelligence, A history of ideas and achievements, p 13

⁴⁹Computing Machinery and Intelligence

⁵⁰ Artificial Intelligence, A Modern Approach

<p>“The exciting new effort to make computers think... machines with minds, in the full literal sense” (Haugeland, 1985)</p> <p>“(The automation of) activities that we associate with human thinking, activities such as decision-making, problem solving, learning...” (Bellman, 1978)</p>	<p>“The study of mental faculties through the use of computational models” (Charniak and McDermott, 1985)</p> <p>“The study of the computatins that make it possible to perceive, reason, and act” (Winston, 1992)</p>
<p>“The art of creating machines that perform functions that require intelligence when performed by people” (Kurzweil, 1990)</p> <p>“The study of how to make computers do things at which, at the moment, people are better” (Rich and Knight, 1991)</p>	<p>“A field of study that seeks to explain and emulate intelligent behavior in terms of computation process” (Schalkoff, 1990)</p> <p>“The branch of computer science that is concerned with automation of intelligent behavior” (Luger and Stubblefield, 1993)</p>

Figure 1.1 Some definitions of AI. They are organized into four categories:

Systems that think like humans	Systems that think rationally
Systems that act like humans	Systems that act rationally

As we can see from the bottom paragraph, two of the definitions are based on human beings, how they think or act and the other two are based on rationality, which again could be led back to human intelligence. It is important to recognize that actions can be rational without intelligent background, therefore the actions of

a machine could be rational even if it is not an intelligent one. Russell and Norvig state that the tension between these definitions boil down to approaches centered around humans and approaches centered on rationality. They then continue to give examples for all four definitions and how they should be approached. I will not go too much into detail with their research but rather point out the key aspects of these approaches.

2.2.2 The Turing Test

The Turing Test, named after its inventor Alan Turing (1950), is one of the possible solutions to test if a machine has the capability to think like a human being or more precisely to exhibit intelligent behavior in a way that is either equivalent or even indistinguishable from that of a human. Turing meant it to give results, which could lead up to a definition of intelligence. Like many before and after Turing, he too thought that intelligence or the ability to behave intelligently was to reach human-level ability to solve cognitive tasks in a way that would make the interrogator be fooled about with whom or what he or she is communicating with. In a way the Turing Test is not the most efficient one to test if a machine is intelligent or not, since the test is passed simply by just fooling the interrogator to believe he or she is communicating with another human-being or he or she cannot distinguish if the other party is indeed human or machine. Simply put the machine or AI would have to just imitate human behavior to pass the test and therefore passing it will not tell anything about the machine's intelligence, it just implies the ability to imitate human behavior. Imitating or copying something's behavior might show some hints of intelligence but it itself is not enough to define one's intelligence.

Then, how can we tell if something thinks like a human being. Russell and Norvig pondered the same problem and came up with rather simple-sounding answer; determine how humans think. They gave two different means to determine human thinking. The first was introspection ergo the examination of one's own conscious

thoughts and feelings. The second being different psychological experiments. They argued that once a precise theory of the mind is created it is possible to apply that theory to a computer program. What follows is that if the computer program created by using this theory of the human mind acts and behaves like a human it must then operate in a similar way to human.

Cognitive modeling approach may seem similar to The Turing Test because in a way human behavior is once again the line, which the machine must cross for to be deemed intelligent. The Cognitive approach, unlike the Turing Test, defines intelligent as an ability to think like human, which is rather different from behaving like human. Both, thinking and behavior can be imitated, but to imitate thinking is much more complex matter since behavior is mainly just mechanical.

Another type on intelligence, behaving and thinking like human aside, is thinking and acting rationally. Rationality, a reasoning process that ultimately leads to right thinking and therefore to a right solution, a rational solution. Now, for something to be rational does not always mean it is the right thing to do. Just by adding moral and ethical codes to the process, the rational answer might not be the “rational” one.

Rational thinking process might be used to create intelligent machines and AI. Russell and Norvig mentioned in their research that there are two obstacles that are problematic for using rational thinking process as a blueprint for making AI. Firstly, they stated that it is not easy to take informal knowledge and state it in the formal terms required by logical notation. The second problem lies within the comparison between in principle and in practice. Solving a problem in principle is altogether another thing than to solve a problem in practice. Russell and Norvig then added that even problems with a moderate number of facts could overload the computers capability to compute if the computer or the program is not guided in some way.

The last approach of Russell's and Norvig's study centers around rationally, but this one is about acting rationally, not thinking like the previous one. They use the word agent as a term for something that perceives and acts and furthermore AI in this approach is viewed as the study and construction of rational agents.

2.3 Examples of AI creators

One of the first AI creators was a computer program called Racter, who wrote the book "The policeman's beard is half constructed" in 1984. Racter was fed with grammar rules and vocabulary and then it created the text with random generation and therefore the book is not pre-programmed. Racter can create texts by using its files, which have been given to it by the programmers.⁵¹ Racter is not the only AI creator and there have been others, like AARON and BRUTUS.⁵²

A more present and probably the most famous example is the Next Rembrandt, a "painter" AI, which tries to imitate Rembrandts' famous paintings.⁵³ The Next Rembrandt was taught with the style of the late Rembrandt and it would then create a new piece of art that resembles Rembrandts' art astonishingly well.⁵⁴ The AI in question took virtually every little detail of Rembrandts' works into account while creating the new piece of art.⁵⁵ The Next Rembrandt's art has already led to a research done by Shlomit Yanisky-Ravid, since in The Next Rembrandt project there were a number of people involved with an enormous amount of work. The obvious question arises: Who, if anyone, owns the copyright to The Next Rembrandt's art?⁵⁶

⁵¹ Can a computer be an author? Copyright aspects of a artificial intelligence 707:715;
<http://www.ubu.com/historical/racter/index.html>

⁵² Robots Unlimited. Life in a virtual age;
<https://newatlas.com/creative-ai-algorithmic-art-painting-fool-aaron/36106/>

⁵³ <https://www.nextrembrandt.com/>

⁵⁴ Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era – The Human-Like Authors Are Already Here – A New Model, p. 663

⁵⁵ Artificial Intelligence and the Copyright Survey, p. 2

⁵⁶ Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era – The Human-Like Authors Are Already Here – A New Model, p. 669

Another example is e-David, which is also an AI-painter. Like with The New Rembrandt, e-David's creations are original intellectual property works. E-David takes photos with its camera and then creates paintings, using these photographs as reference. Although e-David creates new with the software, which is purely made by its programmers, it still takes photographs independently and this could be seen as its own creative input on the works⁵⁷

As we can see from this rather short presentation of AI-creators, they are reality and out there, creating and inventing. Some of these AI-created works are even displayed worldwide in different exhibitions.⁵⁸

⁵⁷ Feedback-Guide Stroke Placement for a Painting Machine

⁵⁸ <http://www.metropictures.com/exhibitions/trevor-paglen4/>

3. Copyright legislation and authorship

Seeds of copyright, as we know it today, were sown alongside with the discovery of printing technology. The possibility to print and distribute literature at a much greater scale than ever before created a new market and the market created an incentive for the authors; their work needed protection against copying and unfair financial gain. Besides the printing technology the essential forerunner for intellectual property rights was the privilege system in the 16th century. Those privileges only protected the investor rather than the actual authors or innovators.⁵⁹ The concept of common good has always played a part in the IPR legislation, even in the privilege system, although the privilege system included heavy centralization of the monarch power. Nowadays the common good is an essential part of the whole IPR system.⁶⁰

The English Statute of Anne of 1710, also known as the Copyright act 1710, provided the government and courts to regulate copyright. This Statute can be seen as the birth of a legalized concept of authorship and copyright, although the Statute does not involve terms “copyright” or “author”.⁶¹ The development of intellectual property rights and copyright took an important step forward with the declamation of the constitution of the United States of America in 1787. The Constitution gave the right for the legislator to give exclusive right for innovators and authors. France followed the same philosophy with its copyright laws after the French Revolution.

The Paris Convention and The Berne Convention were mentioned at the start of this thesis. The Berne Convention is a fundamental foundation of copyright as it has 173 different contracting parties around the world.⁶²

⁵⁹ Immateriaalioikeus, p.5,

⁶⁰ Immateriaalioikeudet ja yleinen etu, p. V. 2017

⁶¹ The Author: From Death penalty to Community Service, p. 5

⁶²http://www.wipo.int/treaties/en/ShowResults.jsp?treaty_id=15

It could be said that at least in Europe the copyright legislation has followed a more author-oriented path and patent legislation followed a more economy-oriented path.⁶³

This chapter will introduce and go through copyright legislation and case law of the European Union, the United States of America and Finland. Focus here is on the authorship of a given work. This chapter will also present and research case law throughout the abovementioned legal systems. The purpose here is to represent current legislation on copyright and link the legislation and case law on to my research problem and use legal analysis to find the legal grounds for authorship and ultimately try to answer the question: can AI be an author?

3.1 Authorship

International treaties have no definition of authorship or whether a work requires a human author in the first place but like with any other law or legal treaty it is the assumption of having a connection to a human. For example, the Berne Convention grants moral rights to the author, but how one can tell a human-created work apart from a computer-created work? It might indeed be an impossible task, but the work must be connected to a human author in order to be copyrightable, this is the basic assumption of different legislations, which are researched further down this paper. The copyright theory is altogether founded on the assumption that ideas come from human minds and humans are the fountain of creativity. These facts make it so that most of the IPR legislation is based on the assumption of a human author.⁶⁴ In the light of these assumptions it is quite surprising that only few decisions address what authorship means or even who is or can be an author and even fewer copyright laws touch the idea of authorship or

⁶³ Imateriaalioikeus, p. 7

⁶⁴ Intellectual Property in the Era of Creative Computer Program: Will the true Creator Please Stand Up? p.1676

tries to define it.⁶⁵

Author, the sole word tells us what it means; the creator of something, most usually a book or a song. Questions on authorship issues could be fairly easy if that was the case. Author and authorship differ as a general term from that of a legal one. Therein lies the problem when defining the term authorship or author, do we want to define it as a general word, which is used in our everyday life or do we pursue the legal definition of the word. It is rather clear that in this thesis the goal is to define the legal one. Legal concept of authorship is the pillar of copyright, since there cannot be any copyright in the first place if there is no author.

The subject of copyright has evolved greatly in the history of IPR's. In its wake the subject of copyright was thought to be a representation of its creator's personal ideas and thoughts. This doctrine is called subjective copyright doctrine whereas the objective copyright doctrine places the piece of work in its abstractive form as the subject of copyright. Piece of work can therefore be recognized from its external manifestations. This doctrine is close to Joseph Kohler's Immaterialgüterrecht -theory.⁶⁶

Authorship as a legal concept saw its birth between the late eighteenth and early nineteenth century. Copyright, as every legal concept, draws from the surrounding cultural context and cannot be therefore understood solely by examining different legal sources.⁶⁷ Lion Zemer claims that theoretical considerations are the foundation for every ideology behind intellectual property.⁶⁸ Authorship is the basis for copyright in general. For a work to be copyrightable in the first place it must have an author, the one who makes the work. Then again, what is authorship

⁶⁵ The Concept of Authorship in Comparative Copyright Law, p. 5

⁶⁶ Tekijänoikeus ja lähioikeudet p.47-48, 2005

⁶⁷ Toward a Theory of Copyright: The Metamorphoses of "Authorship", p. 456

⁶⁸ On The Value of Copyright Theory, p. 1, 2010

or who or what is author. These are the questions that one must answer to really understand the idea behind copyright.⁶⁹

Authorship is not only a legal concept, but a complex literary theory also has a take on the matter.⁷⁰ Authorship may have started as a general term and idea, but it soon created a legal life of its own. Authorship has evolved on two different trails that have intertwined, and nowadays it is quite hard to separate the legal concept of authorship from the cultural one. One could say that the legal concept of authorship is being a hostage to the cultural one.⁷¹ The legal concept of authorship cannot evolve on its own and try to redefine itself and bring the whole concept to modern age. Problem with authorship is also due to the fact that there is no one coherent theory on authorship and therefore it is not effortless to define what behavior of the creator could lead to copyrightable authorship.⁷²

Copyright became an important part of the common economy when printing was invented; now anyone who wrote a book could benefit from it financially. To protect authors a copyright was “invented”, of course the idea of copyright is much older, but now law gave protection for literature works.

3.1.2 Death of the Author – do we need authors?

As IPR's in general, the concept of authorship has received its share of criticism and even hostility. One of the arguments made by these critics include the notion that copyright relies heavily on the romantic figure of an author and continues to claim that romantic author is dead and therefore copyright too must be dead.⁷³

⁶⁹ The Concept of Authorship in Comparative Copyright Law, 03-51, 1

⁷⁰ The Author, p. 4

⁷¹ Shaman, Software, and Spleens – Law and the Construction of the Information Society, 114-7

⁷² A Theory of Copyright Authorship, p. 1231

⁷³ Concept of Authorship in Comparative Copyright, p. 4

The Death of the Author is a famous essay written by Roland Barthes, a French literary critic and theorist. Barthes claimed that the writer and the one who actually creates the work are in fact unrelated. He argued that every work ever done is “*eternally written here and now*” as everyone who reads the text, writes it anew.⁷⁴ If we take this idea a bit further, I could argue that everyone who reads a certain given text becomes the author and thereby it is irrelevant to have authors in the first place. This idea would also solve the problem with AI being a creator of a work. Since the creator is just the one who creates the text, authorship does have nothing to do with creating.

Given the idea of not needing an author, I now present an example of a problem with authorship. You could take two random texts that are in a similar form, and then compare them by trying to find hints about the author’s personality, beliefs and opinions. Both texts are novels and well written. Then you are given a task; try to tell which one of the texts is written by a human author, and which of them is written by an AI. Nobody could tell the difference just by reading and analyzing them, because the work itself is not important. It all comes down to authorship; the work can be anything, even an utterly terrible story, as long as it is its author’s original work. Copyright is built on authorship and it needs an author.

3.1.3 Six signifiers of authorship

Tuomas Sorjamaa divides authorship into 6 sub-categories in his masters’ thesis, that he then calls the six signifiers of authorship. These six signifiers are; 1) Originality, 2) Personality , 3) Labour , 4) Intent , 5) Ownership , 6) Investment .⁷⁵ Since Copyright is so heavily based on authorship it is meaningful to examine authorship from different viewpoints such as given by Sorjamaa.

⁷⁴ Death of an Author

⁷⁵ I, Author – Authorship and Copyright in the Age of Artificial Intelligence, p. 34-44

According to Sorjamaa these six signifiers define the term authorship, but the list is not even exclusive. Since authorship as a concept is so complex it is not even possible to give a perfect definition of authorship in this thesis. Defining authorship perfectly is not even that important for this thesis, but to get the idea why authorship is such an important part of copyright.

As I stated before, originality is the most important part of authorship. If the work is not original, it therefore cannot enjoy protection by copyright. Personality somewhat overlaps with originality or rather personality is part of originality. This is most obvious with a copyrightable work like a book. Writer's personality will at least have some input on the final work. Labor is quite obvious since without having your own input on the work you should not have copyright over the work, and it can be argued that such works that do not require any labor should not be copyrightable. Intent as a factor in authorship is rather hard to define at least when there is only one author. In joint authorship intent plays more important role where it can be used to define who should have ownership over the given work. Nevertheless, intent can complex the matter more than it solves. Ownership is one of the key aspects of authorship. Usually author is also the owner of a work and copyright, so authorship and ownership are tied into each other. There might be cases where the author and the owner are not the same person, but these cases are somewhat rare. Lastly investment ties into labor and intent since investment can be seen as both. When creating something new you must work for it, this gives us labor and as a by-product we get intent; creators intent is to create something. These two factors can then be transformed as investment.

These six signifiers of authorship are a good tool to recognize the different aspects of authorship, but I would argue that many of these signifiers are so overlapping that it would be better to have fewer signifiers in order to get a more, clear definition. I thereby suggest that these signifiers could be originality, ownership and investment. These are the most crucial parts of authorship at least when looking from a legal point of view.

3.1.4 Originality

Originality is one of the most important factors in copyright. Originality is the factor that differentiates work from others and therefore making it a new work rather than a copy. Threshold of originality can be traced from all of the copyright laws around the world. It should be noted that threshold for originality should not be placed too high and that different fields of work have their own threshold. Original ideas as such are not protected by copyright; it is the end product, which may be vested with one.⁷⁶ Could AI-created works be original in the sense that everything other aside, these works could be protected by copyright? I would firmly answer yes, since it is not the end-product, which is the main issue with AI-created works. Like I stated before; the work can be anything, even a really bad story, as long as it is its author's original work.

In this thesis I research these thresholds among other factors of copyright from three different copyright legislations, that of European Union, Finland and United States of America.

3.3 Copyright legislation of European Union

Copyrights and intellectual property rights, among other portions of legal system, are harmonized in the European Union. The harmonization regarding Intellectual property rights began on 1988. The Trademarks Directive or Council Directive 89/104/EEC paved the way for the copyright harmonization among the Member States.⁷⁷ The Green Paper on Copyright and the Challenge of Technology⁷⁸ was given before the Trademarks Directive on June 1988. During the 1990's the harmonization continued, and many new directives were issued. Those directives harmonized copyright issues regarding computer programs, rental rights and databases, just to name a few. Important part of the 90's progress was the

⁷⁶ Juridiikan perusteet, p. 526

⁷⁷ Directive 89/104/EEC

⁷⁸ Copyright and the Challenge of Technology: Green Paper

European Commissions' White Paper on Growth, Competitiveness, Employment: The challenges and ways forward into the 21st century.⁷⁹

A follow-up to the White Paper; Europe and the global information society: Recommendations of high-level group on the information society to the Corfu European Council, for short Bangemann Report.⁸⁰ This report was meaningful as it recognized and acknowledged the importance of IPRs in creating a more competitive European industry in the area of information technology as well as in other sectors of industry. The Report then recommended common rules to be agreed and enforced by the Member States. Another Green Paper was published in 1995 and it was called the Green Paper on Copyright and related rights in the information society.⁸¹

Although the harmonization is not total as there is no EU copyright code; harmonization is achieved through different directives. It would be most efficient to have full harmonization on the field of intellectual property rights among the member states of EU. However, no such legislative initiative is under way, at least not yet. Yet, harmonization is not achieved through legislative action and legislation only, the case law of the Court of Justice of the European Union (CJEU) is also important and usually the case law *de facto* creates harmonization. One such example of the CJEU's contribution to the copyright harmonization is the case of *Infopaq*. The given case formed a harmonized understanding of the originality requirement, an important principle of copyright. The case of *Infopaq* will be discussed later on, along with the importance of CJEU's case law.

The directive that harmonizes copyrights is called Directive 2001/29/EC of the European Parliament and the Council of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society or the

⁷⁹ Growth, competitiveness, employment, The Challenges and ways forward into the 21st century: White Paper

⁸⁰ Europe and the Global Information Society – Recommendations to the European Council

⁸¹ Copyright and related rights in the information society: Green paper

much shorter name, InfoSoc.⁸² InfoSoc includes articles about reproduction and distribution rights among other things, but it does not state what a copyright is as in a general definition of copyright that would cover every legislation of member states. Copyright itself is not a part of the harmonization the directive only concentrates on the rights that copyright gives to the author.

The Commission of the European Communities gave a green paper in 1988, called green paper on copyright and the challenge of technology – copyright issues requiring immediate action. The Commission did recognize the possible problems arising in the future with computer-generated works. The Commission had to ponder the question, who owns the copyright to a computer-generated, in this case, program. So, the European Union has talked about authorship issues regarding computer-programs nearly thirty-years ago.

“The question then arises as to who, if anyone, owns the copyright in the program that finally results from the process: those who used the computer, those who programmed it, the owner of the computer or conceivably all of these.”⁸³

The Commission did not even consider the possibility for a computer program itself to claim the copyright or to be the author, but the question that they expressed is altogether important.

The following part of the Paper is important for this thesis as the Commission wrote:

“The basis of all copyright protection is the exercise of sufficient skill and labor for a work to be considered original. The Commission inclines to the view that it is those who use the programmed computer, which is essentially a tool, who should

⁸² Directive 2001/29/EC

⁸³ Copyright and Challenge of Technology: Green Paper

be regarded as entitled to protection. This solution has the important advantage of conferring the right on those who are most easily identified."⁸⁴

Now, first of all, the Commission defines originality; the basis of all copyright protection is the exercise of sufficient skill and labor. Secondly, the Commission states that a programmed computer or computer altogether is essentially just a tool. Thirdly, all the above said, they propose that the solution given by them has the advantage of conferring the right on those who are most easily identified. For the sake of the argument I must say that those who are most easily identified do sound like humans. The Commission did not think humans vs. computers when they wrote that line, but now looking back thirty years, it does sound tempting to think that they did.

Leaving all the legal matters that may arise with artificial intelligence aside and its authorship issues, AI as a computer program and or machine itself is more than likely to be protected by a copyright. So, it is obvious that a computer program is protected as long as it is its author's intellectual creation. What if an AI, which is protected by a copyright, creates another computer program that is original in the sense that it is the author's own intellectual creation. For the sake of the argument the AI in this case is capable to create other computer programs without any human intervention and or input. Now, again, all the legal matters aside, I would argue that the AI in this case is in fact the author and thereby entitled to have a copyright for its work, at least more entitled than the programmer of the original AI.

3.3.1 Case law of the European Court of Justice

Originality is not defined in any of the directives or law of the EU, but there have been few cases in the European Court of Justice that can be useful when trying to

⁸⁴ Copyright and Challenge of Technology: Green Paper

define originality in the EU's legislation. I will introduce three different cases that defined originality in the EU's legal system.

Infopaq

Infopaq is a firm that creates summaries of articles from Danish newspapers and then sends those summaries to its customers. Danske Dagblades Forening (DDF) is an association of Danish daily newspaper publishers mainly helping its associates with copyright issues. In the case, DDF became aware of Infopaqs' practices and found out that Infopaq did not have proper authorization from the relevant right holders. DDF then required Infopaq to request consent to do so, which Infopaq then disputed and applied to court. The case was tried at the Danish court, which then referred questions to the Court of Justice. Questions concerned the interpretation of Directive 2001/29/EC on the harmonization of certain aspects of copyright and related rights in the information society, and in particular on the concept of reproduction in part and on whether the procedure in question can be used without the consent of the right holders.

The Court of Justice found that a work is protected if it is original in the sense that it is author's own intellectual creation, as regarding to the Infosoc Directive. The case polished a definition for originality but also the fact that the work must always have author to be protected.⁸⁵

The Threshold for originality in Infopaq was formulated as follows:

- 1) Copyright within the meaning of Article 2(a) of Directive 2001/29 is liable to apply only in relation to a subject-matter which is original in the sense that it is its author's own intellectual creation.
- 2) As regards the parts of a work, it should be borne in mind that there is nothing in Directive 2001/29 or any other relevant directive indicating that those parts

⁸⁵Case C-5/08 Infopaq International A/S v Danske Dagblades Forening

are to be treated any differently from the work as a whole. It follows that they are protected by copyright since, as such, they share the originality of the whole work.

- 3) The various parts of a work thus enjoy protection under Article 2(a) of Directive 2001/29, provided that they contain elements which are the expression of the intellectual creation of the author of the work.⁸⁶

By doing so CJEU formulized the full harmonization of the originality requirement on the EU level. This formula is now being called as a cumulative test of choice, sequence and combination.⁸⁷ On EU level a work created by AI should therefore undergo this cumulative test in order to be recognized as a copyrightable piece of work. It should be noted that this cumulative test only reveals if a piece of work is original or not, in the sense that it can be protected under copyright. This test does not ponder who is the assumed author or who should be vested by it.

Painer

The Case Painer considered copyright issues with portrait photographs. Eva-Maria Painer took a portrait photograph of Natascha Kampusch in 1998. Then in 2006 a newspaper used this old photo of Kampusch and generated another photo of how she would look in 2006, since they did not have an up-to-date photo of Kampusch. Ms. Painer then objected both on the use of her photo and the modification of it. She claimed that both of them were adaptations of her work.⁸⁸

Painer was an important case since it laid out the fact that whatever the piece of work might be, it should be protected under copyright as long as the work is original, and it reflects the author's personality. This is the case if the author was

⁸⁶ Case C-5/08 Infopaq International A/S v Danske Dagblades Forening

⁸⁷ Infopaq and the Europeanisation of copyright law, 202-03

⁸⁸ Case C-145/10 Eva-Maria Painer v Standard Verlags GmbH and others (2011)

able to express his creative abilities in the production of the work by making free and creative choices, as stated by the court on this case.⁸⁹

By adapting Painer decision on to a work created by AI one should come to a conclusion that as long as it is original it should be protected under copyright. Like in Infopaq this case does not take possible authorship issues into account, but nevertheless it strengthens the application of Infopaq decision on works created by AI; As long as the threshold of originality is met, the work shall be protected under copyright.

Football Dataco

On the *Football Dataco* case the issue was with the creation of the fixture lists of the English and Scottish football leagues. *Football Dataco* and Others claimed that they own copyright to such fixture lists. Yahoo and others did not acknowledge such a right existing and hence they could use the given fixture lists without paying any financial compensation. In the end the Court found that fixture lists did in fact constitute the author's own intellectual creation. Once again, the criterion for originality is met when the author expresses his creativity and thereby creates an original piece of work. *Football Dataco* continued on the same path as previous cases *Infopaq* and *Painer*.⁹⁰

3.4 Copyright legislation of the United States of America

The Constitution of the United States of America includes a clause, which authorizes the Congress to protect authors by granting them copyrights and patents.

⁸⁹Originality in EU Copyright, p. 151

⁹⁰Case C-604/10 *Football Dataco Ltd and others v. Yahoo! UK Ltd and others* (2012)

The clause states:

“To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries. ”⁹¹

Copyright Law of the United States of America:

“Copyright in a work protected under this title vests initially in the author or authors of the work ”⁹²

The US copyright law bases the copyright firmly on the author or authors of the work. The term author however is not defined in the copyright law, so the law does not have the answer if AI could or could not own copyright for its *own* work or even be a recognized author in the eyes of the law.

A copyright is granted in the United States by the US Copyright Office. In its compendium of practices it states that:

“ To qualify as a work of “authorship” a work must be created by a human being. ”⁹³

The Office has stated in its practices that it will not register works produced by animals or machines among other things. I have included the list of works that are not copyrightable as stated by the Office here:

“The Office will not register works produced by nature, animals, or plants. Likewise, the Office cannot register a work purportedly created by divine or supernatural beings, although the Office may register a work where the application or the

⁹¹ Constitution of the United States of America, Article I, Section 8, Clause 8

⁹² Ownership of Copyright, 17 U.S. Code § 201

⁹³ The Compendium of U.S Copyright Office Practices, p 15

deposit copy(ies) state that the work was inspired by a divine spirit.”

“Similarly, the Office will not register works produced by a machine or mere mechanical process that operates randomly or automatically without any creative input or intervention from a human author.”⁹⁴

The incident of the macaque monkey that took the photograph made the Office to revise its practices and now it states in its examples that a photograph taken by a monkey is not copyrightable. So, the first quotation makes it very clear that an animal cannot be an author, but it is the last quotation which is important when thinking of works created by AI. As long as there is no human intervention or input, there is no copyrightable work and therefore AI cannot be an author under US’s law. In the light of this information it is quite clear that in the US it is not possible for AI to get copyright.

3.5 Case law of the Supreme Court of the United States

Feist

Feist publications, inc., v. Rural Telephone Service Co. was an important case tried in the Supreme Court of the United States. Rural Telephone Service Company (Rural) is a telephone cooperative company that provides its services in northwest Kansas. Feist publications (Feist) is a company that specialized in compiling telephone directories. Feist used Rurals telephone listings as a part of its own and was then caught. The legal problem in the case was the question if these phone directories in fact are copyrightable and if so, has Feist committed an infringement. Supreme Court found out that phone directories cannot be

⁹⁴ The Compendium of U.S Copyright Office Practices, p 17

copyrighted, since copyright can only apply to original work which expresses the creativity of the author.⁹⁵

Feist was considered to be an important decision, even a landmark; it defined originality. A work can only be copyrightable if it shows at least some minimal degree of creativity and it is a work of authorship. Before Feist there was a doctrine called a sweat of the brow, which emphasized the actual diligence it took to create a work rather than taking into account the actual originality and creativity of the work. After Feist this doctrine was dismissed, and the Feist decision became a new ground rule of copyright.

Like in the European practice the threshold of originality must be met also in the US. Even though AI cannot be recognized as an author in the US, the Feist decision would be applied to such works if there ever comes a day that AI is recognized as an author.

3.6 Copyright legislation of Finland

Finland has its own copyright law called Copyright Act.⁹⁶ Copyright was legislated for the first time in Finland in 1829. It regulated that the creator of the book as well as the translator had an exclusive right to publish the said book and sell it.⁹⁷ The current legislation is from 1961. In its first section it states:

*“A person who has created a literary or artistic work shall have copyright therein, whether it be a fictional or descriptive representation in writing or speech...”*⁹⁸

⁹⁵ Feist Publications, Inc. v. Rural Telephone Service Co., 499 U.S. 340 (1991)

⁹⁶ Tekijänoikeuslaki 404/1961

⁹⁷ Tekijänoikeus ja lähioikeudet, p. 6,

⁹⁸ Tekijänoikeuslaki 404/1961 § 1

Aforementioned states a presumption, which is used in the Finnish legal system. This presumption could be shown to be incorrect by giving rebuttal.⁹⁹ Copyright Act does not define originality in any way nor even mentions it as a requirement for copyright. The Finnish copyright system seems to lean on solely to the author of the work:

*a person who has created a work shall have copyright therein.*¹⁰⁰

Since the Copyright Act uses the term person, it is quite clear that under the Copyright Act of Finland it is not possible for AI to have copyright for its own work. Although the term person is not defined in the Copyright Act one can assume that it is only intended to mean humans, not animals or machines and this assumption can be found in the preliminary work of the Copyright Act.¹⁰¹

The preliminary work of the Copyright Act states that the first clause of the Act actually gives the requirements for copyright protection. The words create and work lead up to the requirement of independency, novelty and originality. Legal praxis and literature have then formed the requirement around the terms of independency and originality. These terms can also be replaced by the term breaching the threshold for originality or reaching the threshold for originality.¹⁰²

Finnish Copyright Act gives the possibility for multiple authors as well as the other copyright laws around the world.

“If a work has two or more authors whose contributions do not constitute independent works, the copyright shall belong to the

⁹⁹ More on the matter; Sijthoff Stray p. 90 and Olsson p. 78

¹⁰⁰ Tekijänoikeuslaki ja Tekijänoikeus ja lähioikeudet, p. 107

¹⁰¹ Tekijänoikeus, p. 16

¹⁰² Tekijänoikeuden loukkaus, p. 40-41

*authors jointly. However, each of them is entitled to bring an action for infringement.”*¹⁰³

The Finnish Copyright Act also includes a clause of assumed authorship. This clause is used when there is etc. a pseudonym used on the copies of a work. Clause is as follows:

*“The person whose name or generally known pseudonym or pen name is indicated in the usual manner on the copies of a work or when the work is made available to the public, shall be deemed to be the author, unless otherwise demonstrated” and “ If a work is published without the name of the author being indicated in the manner described in subsection 1, the editor, if he/she is named, and otherwise the publisher, shall represent the author until his name is indicated in a new edition of the work or notified to the competent ministry”.*¹⁰⁴

Assumed authorship could be understood in a way that for one to be an author, one does not need to present ones' personality e.g. your work does not need to be connected to you for you to be author. It is important to understand that the assumption does not create copyright. The true owner of copyright can demand compensation if the assumption has led to discrimination against his or her copyright. Assumed authorship also usually grants the third party a right to trust the assumed author as in the third party cannot be held accountable later on.¹⁰⁵

3.6.1 Case law of the Supreme Court of Finland

KKO:2005:43

¹⁰³ Tekijänoikeuslaki 404/1961 § 6

¹⁰⁴ Tekijänoikeuslaki 404/1961 § 7

¹⁰⁵ Tekijänoikeus, p. 86-87

The case was about textbooks and wordlists that were included in said textbooks. The accused party in this case copied those wordlists. Threshold for originality is passed when it can be assumed that only the author of the work could have ended up with the same result. So, this case gives the definition of originality for Finnish legal system as it is not defined nor mentioned in the Copyright Act.¹⁰⁶

3.7 AI as author

This chapter has researched current legislation and case law on copyright and on some legislations, it is quite clear that AI cannot be an author or recognized as one let alone be vested by copyright. Even the Berne Convention does not provide an answer to these problems. Although some scholars argue that the Berne Convention does not require a human author and others that there needs to be a human to author the work.¹⁰⁷ In the guide to Berne Convention it states that the author is not specified.¹⁰⁸

The US's law states clearly that in order to qualify as a work of "authorship" a work must be created by a human being. European or Finnish law are not that specific on the matter, but it can be traced from the legislation that AI cannot be an author nor be vested with copyright.

This state of matter will not change until AI has personhood of its own. Even though it is interesting to ponder the possibility of an AI author it is still quite futile since the whole possibility halts at an early stage and the whole question of AI as a legal person is a theoretical one at the current moment.¹⁰⁹

¹⁰⁶ KKO:2005:43

¹⁰⁷ Translation Technology and Copyright, 330

¹⁰⁸ Guide to the Berne Convention for the Protection of Literary and Artistic Works

¹⁰⁹ Legal Personhood for Artificial Intelligences, p .1231

3.8 Legislation drafts and future of AI legislation

Copyright acts and copyright legislation in general are quite similar in every country and the other similarity between countries is the lack of legislation considering robots and AI. Some countries have taken action, to some extent, to regulate robots and AI. These countries include for example The United States of America, Europe, Japan and South Korea.

Currently Members of Congress have introduced a number of bills and resolutions on artificial intelligence, but they do not cover copyright issues.¹¹⁰

European Parliaments Committee on Legal Affairs gave a draft report in 2016 regarding recommendations to the Commission on Civil Law Rules on Robotics.¹¹¹ The draft calls the Commission to draft legislation considering the current issues with robotics and AI. The European Parliament voted on the draft proposal in February 2017 and the draft passed with some changes on the original draft. It is crucial for the AI and robotics industry as well for the EU as whole, to recognize these issues and take action. The sin of law is its inability to keep up with the current and evolving technology and therefore legislation is more than often accused of slowing down progress since it is regulating something that is already outdated. I am optimistic that the EU has the will to look courageously into the future and give possibilities for the evolution of AI.

The Japanese government established an Artificial Intelligence Technology Council in 2016 by the order of Japanese Prime Minister Shinzo Abe. The Council finished its work in March 2017 when they published the Artificial Intelligence Technology Strategy.¹¹² This strategy paper focused mainly on promoting AI development. In 2018 the Japanese government made another important announcement regarding AI; Artificial Intelligence would become an official part of its integrated innovation strategy. The governments' aim is to increase young

¹¹⁰ <https://www.loc.gov/law/help/artificial-intelligence/americas.php#us>

¹¹¹ Recommendations to the Commission on Civil Law Rules on Robotics

¹¹² Artificial Intelligence Technology Strategy

researchers in the AI-related science.¹¹³ Japan has also published Draft AI R&D GUIDELINES for International Discussions, it was made in preparation for the Conference toward AI Network Society.¹¹⁴ This draft is not meant to be regulative, but a list of non-binding AI R&D principles and guidelines.

South Korea started their own AI strategy in 2016 by creating an Artificial Intelligence Information Industry Development Strategy.¹¹⁵ This strategy includes a list of converging technologies like AI, Internet of Things (IOT), cloud computing and big data.

¹¹³ <https://futureoflife.org/ai-policy-japan/?cn-reloaded=1>

¹¹⁴ Draft AI R&D Guidelines for International Discussions

¹¹⁵ Artificial Intelligence Information Industry Development Strategy

4. Who owns copyright

In this chapter my thesis is trying to answer the question, who owns copyright to a work produced by AI assuming that AI is the “author”. There is a good example in the article Copyrights in Computer-Generated Works: Whom, If Anyone, Do We Reward? by Darin Glasser. In his article Glasser uses computer-generated art as the basis of the authorship and copyright problem. He then gives five separate and different possibilities. These possibilities are the computer programmer, the user of the program, both the programmer and the user, the computer or no one.¹¹⁶ Tuomas Sorjamaa uses this same system in his own thesis I, Author – Authorship and Copyright in the Age of Artificial Intelligence.¹¹⁷ Andrew J. Wu has a similar set of options in his brief article from 1997 Dealing with Copyright aspects of Computer-aided authorship.¹¹⁸ These five options were the alternatives to which I ended up myself when thinking about the possibilities to who could own the copyright to a work created by AI.

Ownership issues might be complex and there might even be cases where multiple parties are associated with AI and try to claim copyright for its work. Rex Shoyama gives an example in his essay;

“One party may patent certain technologies used in the agent, while another party may copyright the software code composing the agent. If the agent contains the personal/private data of other third parties, these third parties may have some claims to that data. There is also an end-user that has paid money for the right to use the agent. Finally, there is also likely an investor who has been instrumental in the creation of the intelligent agent in the first place. Do any of these parties have a proper

¹¹⁶ Copyrights in computer-generated works: Whom, if anyone, do we reward?, clause 6

¹¹⁷ I, Author – Authorship and Copyright in the Age of Artificial Intelligence, p. 45

¹¹⁸ Dealing with copyright aspects of computer-aided authorship – New Class of Disputes Between Programmers and Users

copyright ownership claim to the works generated by intelligent agents?”¹¹⁹

This thesis uses the aforementioned five alternatives to explore the possibilities of the authorship of copyright. It should be noted that the following pages are the most important and demonstrative in this thesis. Existing legislation will be used as the basis for all the five alternatives.

4.1 AI as the owner of copyright

The most general solution for copyright problems is that the author, the one who has created the piece of work, is the owner of copyright. This solution can be found for example in the directives and legislation presented in this thesis.¹²⁰ So, following this option it would be easy to just say that if AI has made the work, then AI should have the copyright as well. Unfortunately, the answer is not that simple. The problem is not on the authorship part since AI can very well be a recognized author of its own work, but not in the legal sense. Rex Shoyama claims that authorship must be understood to be distinct concept from ownership and works generated by AI (or as he says Intelligent Agent) meet the necessary requirements for copyright protection. In cases with AI it might not be sensible to grant ownership of copyright to author.¹²¹

Anything besides a human being does not have legal personhood, which is a general requirement for owning or having rights in the first place. It is the legal personhood that is crucial for everything, without it there are no rights or obligations. Visa Kurki has pondered the nature of legal personhood and legal

¹¹⁹ Intelligent Agents: Authors, Makers, and Owners of Computer-Generated Works in Canadian Copyright Law, p. 130

¹²⁰ Look for chapter 3

¹²¹ Intelligent Agents: Authors, Makers, and Owners of Computer-Generated Works in Canadian Copyright Law, p. 134

subject on his essays and has presented criticism over the common understanding of these concepts.¹²²

*”Kun kysyn, voiko tekoäly olla oikeussubjekti, kysyn oikeastaan, voidaanko tekoälylle lainkaan myöntää subjektin asemaa jollain oikeudenalalla. Nähdäkseni kysymys on pohjimmiltaan siitä, voidaanko tekoälylle ulottaa tiettyjä hohfeldiläisiä oikeusasemia, eli erityyppisten oikeuksien ja velvollisuuksien pienimpiä ainesosia”.*¹²³

This idea to possibly grant minor pieces of certain right to AI is fresh and forward-looking and it might prove to be useful in the coming deliberation of AI’s possible rights. Kaarlo Tuori has even stated that the legal subject is a concept that reaches deep into the core of law itself and is thereby part of every western legal system.¹²⁴ Therefore it is not strange that even the idea of granting AI a legal personhood raises so many questions and concerns among scholars and public alike that if such a time comes, AI might have evolved to an almost humanlike state. AI as reality is fairly new, but the idea of granting rights to other beings than man is quite old indeed. Here is a quotation from 1876 by Wilhelm Lavonius:

”Eläin tuntee olemuksensa, huomaa itsensä ja samassa myös jossakin määrässä häntä ympäröivän maailman; eläimellä on kuvaus-aisti ja ymmärrys. [...] Kullakin eläimellä on oma olentonsa, oma määräyksensä, sen on eläminen ja toteuttaminen aatteensa. Eläintä ei sentähden saa pitää oikeuksien esineenä, vaan päinvastoin oikeus-itselönä, olentona, jolla on oikeuksia. Näistä ansaitsevat varsinkin eläimen oikeudet ihmistä kohtaan huomiota.

[...]

¹²² More on the legal personhood of AI: Solum, Legal Personhood for Artificial Intelligences

¹²³ Voiko Tekoäly olla oikeussubjekti? P. 823

¹²⁴ Kriittinen oikeuspositivismi. p. 202-212

Kesyllä, ihmisen palveluksessa olevalla eläimellä on laajemmat oikeudet ihmistä kohtaan kuin kesyttömällä, mutta tälläkin on järkähtämättömät oikeutensa. Eläinkunnalla on oikeus ihmiskunnalta vaatia ei ainoastaan sääliväistä kohtelua, vaan myöskin apua, hoitoa ja jalostamista.”¹²⁵

As we can see, the discussion on legal personhood at least on same state is an ongoing process. In fact scholars around the world have recently started to support the idea that with the evolvement of AI technology and even its current manifestation will ultimately lead to the recognition of AI as a possible owner of legal personhood with its own rights and responsibilities. This can be based on two factors: defining features of AI are similar to that of humans and AI could be assimilated to firms, which can possess rights and responsibilities.¹²⁶

The core idea behind copyright is to protect the creator against masses, and to say it blunt, against copying. This creates an incentive for the creator to create new. Does a machine have any incentive to create? At this point the answer is a simple no. Then again, a theoretic humanlike AI could indeed possess the will to create new things in order to gain wealth and pursue its¹²⁷ goals.

The consensus seems to be that AI cannot own copyright, but there are some who disagree.¹²⁸ For instance Andrew J. Wu who analyzes the CONTU rule¹²⁹. He agrees that the user of a computer program has a stronger claim for copyright if he/she has contributed most of the creativity needed to create such a work. Then again, this rule does not make sense in his mind when the user’s contribution is

¹²⁵ Vuosikertomus eläintensuojelus-yhdistyksen Helsingissä yleiseen kokoukseen toukokuun 27:nä päivänä vuonna 1875 yhdistyksen sihteeriltä.

¹²⁶ Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era – The Human-Like Authors Are Already Here – A New Model, p. 684

¹²⁷ AI is It in this thesis. There is no need to ponder the possible gender of a theoretical AI. I will leave the problem for the sociologist of the future.

¹²⁸ Look for Copyright for Literate Robots, James Grimmelmann

¹²⁹ A rule promulgated by the National Commission on New Technological Uses of Copyright Material (CONTU): The user of a computer program is the copyright owner of the work, and the computer program is a mere tool of the user.

only generic like in the example of his article where the user only types in “sailboat” or “pyramid” and the program creates a picture. Wu continues to address the copyright ownership issue by stating that while the computer programs are becoming more and more sophisticated and their creativity output increases compared to that of a user of the given program a more complicated analysis is required.¹³⁰

There are some problems in denying AI to own copyrights. One of the problems lies in the personality of the author. Personality is not a requirement for copyright, at least not ‘with human authors. Humans can own copyright via pseudonyms, so their work is not connected to them directly, the work is not connected to the authors personality. How does AI differ from a human author who has not any known or public personality in the first place?

I can state here that AI cannot own copyright even if the answer for that question was a foregone conclusion from the beginning. It is still important to shed light on why it is so. In the end copyright issues concerning AI created works will not be the top priority ones when the evolution of AI shatters the barrier between man and machine once and for all.

4.2 Programmer of the AI as the owner of copyright

The programmer of the AI and the user of the program/AI are the two most obvious and strongest options for the ownership of copyright. I start with the programmer and then continue on to the user and then ponder the possibility of a joint authorship.

When a programmer creates an AI/program, he/she then has the copyright for that AI as computer programs are protected by copyright. The given AI is the

¹³⁰ Dealing with copyright aspects of computer-aided authorship – New class of Disputes Between Programmers and Users

programmer's creative work. Now, it could be considered that everything the AI creates is just an extension of the programmer's individual and creative work.¹³¹ In this example it is indeed the programmer who does all the creative and innovative work and the possible end-user might just push a button or write few words or select a set of options to create a work of art via AI.¹³² The end-user as the owner of the copyright might be ruled out only if the work created is repeatable and the required user input is limited, like it was mentioned above.¹³³

This point of view is not without problems. Even if the fictional AI would only be a creative work of its programmer and everything it creates would only be an extension of the programmer's individual and creative work, the only thing the programmer does is to *breathe life* on to the AI e.g. writing the code, algorithm, the DNA of the AI. In the current state of AI, it would not be an individual and self-thinking, self-aware construct. However, once the so-called true AI emerges it will be a separate being from its programmer and from the possible end-user. Surely the programmer is behind it all, but who could claim authorship over works created by an intelligent, self-aware being, that could be deemed a crime.

Finally, it comes down to the question if AI is only a tool, however intelligent it might be, or not. The tool-option would contrast AI to a pen, a brush or a guitar, only a means to an end. Being a tool would argue against the programmer as the owner of the copyright as the programmer would just be an enabler; by his/her work it is a possibility to create something. Then again, if AI is considered to be something far greater and unique than a tool it would mean that AI should have or should be vested with rights and obligations e.g. legal personhood of a kind.

Currently it would be the most obvious answer that it is the programmer who owns the copyright. He/she has invested massive amounts of time, money and dedication to the creation of AI. In the end copyright is meant to protect

¹³¹ Allocating Ownership Rights in Computer-Generated Works', 1190

¹³² Like in the example given before by Wu

¹³³ From Video Games to Artificial Intelligence: Assigning Copyright Ownership to Works Generated by Increasingly Sophisticated Computer Programs, 174-5

innovative new works that have been created. Protecting the works of a programmer does encourage programmers to continue creating new inventions and coding new possibilities.¹³⁴ Therefore, it should be the programmer who should own the copyright for the work done by the AI.

4.3 User of the program as the owner of copyright

Who owns the copyright when a programmer creates an AI for a customer? Is it the programmer or the end-user of the product? A plain example could be that an AI program has been designed for a certain customer. Said customer then uses this AI to create a new work, maybe just by pushing a button or inputting certain instructions etc. Is it not the user in this example who has created the work even though via AI?

Programmer might still own the copyright to the AI-program itself, but that copyright does not extend to the works created by the program. In this example the user is the instructor and the AI-program is just a tool or an underling who follows orders; execute these orders and the result is a new piece of work.

Problem lies in the input; does the user express such creativity that it should be him/her to own the copyright? This same problem was presented by Wu earlier in this thesis. At the start of this thesis a case was presented where a monkey took a photograph that then lead to a legal dispute over the copyright of the picture. If there is not enough input from the user's side it might even be trivial who in the end pushes the button to create new work.¹³⁵ Such a user could be compared to the monkey Naruto who pushed the remote-triggers button and took the famous monkey-selfie. It is also possible that the end-user uses the program in ways that the programmer or no one else has even thought and therefore using his own

¹³⁴ Copyrightability of Computer-Generated Works, p. 80

¹³⁵ Allocating Ownership Rights in Computer-Generated Works', p. 1201

creativity in order to create a new work. Such usage of the program should then cross the threshold of creativity required for copyright.¹³⁶

On the economical side this option could be seen and even encourage freeriding at the expense of the programmer. This would then be demoralizing for programmers and even for investors in a larger scale.¹³⁷ Even so, the programmer and end-user or the joint authorship of these parties can be seen to have the strongest claims for copyright in the current state of legislation.

4.4 Multiple owners – Joint authorship

A copyright can have multiple owners via joint authorship. All the legislations cited in this thesis include the possibility for a joint authorship.¹³⁸ Joint Authorship could solve many copyright problems, as there would be no dispute between different parties. Joint authorship is not limited only for two authors, in theory there could be a limitless number of authors if each and every one of them has somewhat similar input, intention and their creativity has led to the creation of the work at hand. Joint authorship seems like a fresh idea on the field where the romantic author is still a thing. Joint authorship also feels a democratic approach to the whole copyright problem, to each according to his merits.

Problem lies in the contribution; everyone's contribution should be identified from the work or from the process. It is not necessarily enough for one to share an idea or thought that ultimately leads to a new piece of work, but which is made by another. Usually this type of situation does not lead to a joint authorship.

Joint authorship could solve the problem in this chapter by granting the copyright to the programmer, the end-user and to the AI, all as a group or a mix of two of

¹³⁶ Allocating Ownership Rights in Computer-Generated Works', p. 1207

¹³⁷ Reap the Benefits and avoid the legal uncertainty: who owns the creations of artificial intelligence?

¹³⁸ Check chapter three

these three possible owners. As it was mentioned in the AI part, it could not possibly have intention, at least not in its current state. Therefore, AI could only theoretically be one of the parties of a joint authorship, but more so in the future. Joint authorship is not without flaws as it is sometimes hard to define who should be rewarded and who should not. This problem can lead you into a never-ending spiral of reasoning.¹³⁹

Lion Zemer is a steadfast spokesperson for joint authorship. He even tries to re-define authorship as a joint effort of author(s) and the public:

*The public is plural subject capable of intentional states and shows a collective intention to participate in the creative process and to author.*¹⁴⁰

I find his idea to be rather problematic and far-fetched. Firstly, the public should be defined properly and how could this public author own something or have the intention required in copyright laws?

Even if AI does not have intention, legal personhood and it is only a tool could there be a solution to include AI as a part of a joint authorship? This would require a modification to the legislations around the world; AI could be a contributor to the work as a secondary author. Secondary author could be an author but just a lesser version of it. In the theoretic world where secondary author would exist copyright could also be divided like stocks: The biggest contributor would naturally have the biggest portion of the copyright and the rest of the remaining copyright would be divided among side-authors; to everyone by their merits. This type of copyright model would revolutionize the whole field of intellectual property rights. The sole author would remain as it is now, but joint authorship would evolve to something much more flexible. This way even the minor

¹³⁹ Allocating Ownership Rights in Computer-Generated Works, 1222

¹⁴⁰ We-Intention and the Limits of Copyright, p. 102

contributions could benefit the contributor, and this would lower the incentive to partake in the creation process even with a minor input.

This divisible copyright would also mean that every right that comes along with copyright would also be divided among the authors. I will not go into details how the new problems in this model would be solved like the problem where a main authors contribution is 90% of the final work and 10% is granted to the secondary author, should the secondary author have the right to make new copies solely or with the permission from the main author. In the end this could be the upgrade that copyright needs if it ever wishes to evolve and follow the big waves of change.

4.5 Nobody

Along this thesis it has been made quite clear that AI cannot own copyright even if AI creates a piece of work individually and without human input or intervention. Since AI cannot own the copyright for its work why would a human have the right to own that copyright? A human cannot claim authorship over a work created by another human, why would a work of an AI be any different. Intellectual property laws generally assume human to be the author of a work. James Grimmelmann states five different reasons why works created by AI should be considered to differ drastically from those created by humans. Here is a quote from his essay on the topic:

1. They are embedded in digital copies.
2. People create them using computers rather than by hand.
3. Programs can generate them algorithmically.
4. Programmers as well as users contribute to them.
5. Programs can generate them non-deterministically.

He then continues to claim that even old-fashioned book writing can raise these same problems and that these same problems will remain as long as copyright legislation has a need to assign ownership over a created piece of work.¹⁴¹ Later on Grimmelmann notes that computer-generated works are not in fact different from human created ones and addresses that there should be no reason to create now doctrine for computer-created works in copyright. One of his arguments points that there is no rule on personal jurisdiction on the Internet, so technological evolution might raise new problems, but those problems can be solved with current tools.¹⁴²

Should we leave every computer-generated work out of the copyright system? Why would anyone create something via AI if those works would be left without an author? This problem creates a paradox; granting a right where one is not due seems to be unrighteous and by doing so it could paralyze the system. Logically speaking it would be wiser to grant a right even if it is not justified than not to, if given the aforementioned example. Copyrights are an essential part of economy and one could argue also that it would not be logical to grant copyright to AI

By erasing the whole copyright system and the incentive we would surely hurt the whole economic system; Why would anyone create or invent if there is no prize at the end of the road?

There are even some who question the whole future of copyright like Jane Ginsburg in her article *The Author's Place in the Future of Copyright*.

“The author's place in the future of copyright (assuming copyright has a future) will not be assured until the full range of

¹⁴¹ James Grimmelmann, *There's No Such Thing as a Computer-Created work – And It's a Good Thing, Too*, p. 404,

¹⁴² James Grimmelmann, *There's No Such Thing as a Computer-Created work – And It's a Good Thing, Too*, p. 415-416,

her interests, monetary and moral, receive both recognition and enforcement."¹⁴³

If nobody can claim copyright to a work created by AI, the given work should therefore be placed to public domain immediately after the creation of such work.¹⁴⁴ This option could be the easiest and most logical road to take in order to resolve the matter on AI created works. Since copyright system is largely based on the matter of motivation to receive financial compensation and security on created works, bringing AI created works into public domain would not hurt the idea of copyright as much as granting copyright to AI or would not be as inconsistent as granting copyright to a human. The U.S. Copyright Office has actually practiced this public domain doctrine with works created by non-human. These works are denied of Copyright and are then released into public domain.¹⁴⁵ One could argue that a fictional human author too could be useful in these situations. Timothy Butler is behind this theory of the fictional human author, which states that when a product is created by machine, it should be presumed that behind this creation is a fictional human author. Copyright should in these cases be assigned to the owner of the AI, user, or the owner of the computer or jointly.¹⁴⁶ Andrew J. Wu has a variation of this theory, which states that copyright should be granted to whoever owns the copyright to the AI.¹⁴⁷ Both these theories could be useful in situations that has been addressed in this section. I, on the other hand, am quite skeptical and critical over these theories, since to me they seem to be rather fabricated and regarding my own opinion to grant the AI-created works to public domain, illogical and furthermore these theories lack the justification upon which vesting the copyright should be based on.

¹⁴³ The Author's Place in the Future of Copyright, p. 1

¹⁴⁴ Intelligent Agents: Authors, Makers, and Owners of Computer-Generated Works in Canadian Copyright Law, p. 136

¹⁴⁵ Artificial Intelligence and the Copyright Dilemma, 431

¹⁴⁶ Can a Computer be an Author? Copyright Aspects of Artificial Intelligence, 744-7

¹⁴⁷ From Video Games to Artificial Intelligence: Assigning Copyright Ownership to Works Generated by Increasingly Sophisticated Computer Programs, p. 177

4.6 Copyright for an AI created work

This chapter researched different possibilities for who owns the copyright to a work created by AI. Like with the question of authorship, the ownership of copyright is also futile if one is to suggest that AI could own copyright to a piece of work. Again, the basis for having any rights comes from legal personhood.¹⁴⁸ As it stands now, only humans have legal personhood and they are the only ones who can own copyright, companies themselves get the “authorization” through the forming it.¹⁴⁹

Even though I am quite pro-technology on this matter, I too respect the current viewpoint of legislation and would call for an inspection on the possibility to expand legal personhood for AI at some point in the future. This could be possible via an electric personhood, which was proposed by the European Parliament, but the Commission did not mention it on its outlines.¹⁵⁰ In a way electric personhood could grant some rights or parts of rights in a suitable scope.

AI might never reach the level of consciousness of a human, but if it ever does, then who are we to deny that AI could have its own motivations and desires and maybe even urge to create. For this purpose, legislators should indeed consider legal personhood from a new angle and create incentive for possible mechanical creators to create just like we have now on copyright legislation for humans. I am critical towards negative opinions or fears about the growing technological innovations and would like to see this “old” way of thinking to be cast aside. We live in an ever-changing world and the pace is only going to get faster. Nevertheless, the options for vesting copyright on a work created by AI are currently nobody, end-user or the programmer or a mixture of the last two. AI might be the author in a sense, but from the legal point of view, it does not matter. History seems to carry on its steady path and the only authorized source of

¹⁴⁸ Legal Personhood for Artificial Intelligences, p. 1239

¹⁴⁹ Theories of the Corporation, p.206

¹⁵⁰ European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics and https://ec.europa.eu/commission/presscorner/detail/en/IP_18_3362

creativity can be traced back to the human being, for now. This doctrine and assumptions behind the legislation is and will be challenged in the coming years and decades.

5. Conclusion

During the writing process the case, that inspired this whole thesis, finally reached a verdict. It took six years to solve *the most wackiest case to come to court in years* like cited by The Sun.¹⁵¹ The macaque monkey who took the picture was named Naruto by the PETA as they acted on behalf of the monkey. The case was briefly presented in the first chapter of this thesis and it does not need to be repeated here. Following the oral argument held by the court in San Francisco, both parties informed the court that they are trying to reach a settlement and a court ruling would not be necessary on the case. Finally, on 11 September 2017 parties came to an agreement: David Slater will donate 25% of any future revenues gained by the famous monkey selfies to charities that protect monkeys like Naruto and the wildlife in which monkeys like Naruto live.¹⁵²

I must admit that it never even crossed my mind, when I first read about the case, that it would indeed be the monkey who would ultimately “win” the case. Although the case was not won in court, the 25% of all future revenue of the famous picture can be deemed as such. I dare to say that this case will be a precedent and the same solution could be adapted for disputes over works created by an AI eventually.

Naruto vs. Slater also clearly shows that it is not necessary to solve legal disputes in court, a settlement is usually the best solution for both parties. The downside on this case is that settlements will not create new case law, which is the basis for law to evolve and how future cases will be solved. Still I would not underestimate the solution.

¹⁵¹<https://www.thesun.co.uk/news/4445763/monkey-selfie-picture-british-photographer-david-slater-peta-legal-battle-copyright-what-happened/>

¹⁵² <https://www.npr.org/sections/thetwo-way/2017/09/12/550417823/-animal-rights-advocates-photographer-compromise-over-ownership-of-monkey-selfie?t=1587490735712>

Maybe in the future an AI named Prometheus¹⁵³ might be a part of similar setup like *Naruto vs. Slater* and end up settling the dispute with the help of some AI-protecting organization. This fictional scene could be reality in the future, and I see no reason why such an agreement would not be a possible outcome of a copyright dispute. The most important part of this example is the comparison of animals and AI. Why should an AI be treated differently than an animal, the mechanical nature is of course different than biological nature, but the result does not differ that much; some form of intelligence is formed.

Given all the above I keep the *Naruto Vs. Slater* case in very high regard, the outcome alone is brilliant. This case should light the path for the development of copyright at the wake of true AI. My idea for the joint authorship 2.0 is the other option that should be truly considered. Dividing authorship into main author and secondary author would solve a lot of copyright disputes and create a new possibility to own copyrights. It might just be what is needed in order to bring copyright to 21st century and leave the outdated idea of a romantic author behind. Other fair option would also be the public domain one, where works created by AI are released into public domain outright. By doing so, we would avoid possible legal disputes and achieve some legal certainty on AI-created works.

The current legislation on copyright issues does not recognize any other author than human and it seems that there are some, bold enough, to present fresh new ideas, like that of EU's electric persons. I am happy that these ideas are put on paper and considered thoroughly. The coming legislation on AI is usually quite general and likely misses any binding effect. Strategic papers on AI seems to be the way how different countries are trying to form a coherent strategy for AI related issues in the foreseeable future.

The evolvement of AI-technology is nothing but uncertain and the swiftness or the steepness of the curve of that evolvement or how the policymakers will react to

¹⁵³Prometheus is a titan in Greek mythology who created humans and stole the fire from the gods to mankind.

coming evolution can only be imagined. It is indeed this uncertainty that should be used in order to rethink old patterns and approaches of copyright in order to keep up with the ever-evolving technological world around us. Works created by AI must be placed somewhere in the equation of copyright, whether it is acknowledgment of an AI-author or deeming those works uncopyrightable or something in-between.¹⁵⁴ The most important thing in refining Copyright legislation is the right way, if there is even one, not the rapidity of it. So many issues must first be confronted upfront and then meticulously formulated into new legislation that it will realistically take some time.¹⁵⁵ This new evolving digital technology and digital age in itself could be described as a third wave to challenge, refine and push the limits of Copyright legislation, first and second being the printing press and the wireless press.

In short my conclusion on the matter at hand is that there cannot be any AI authors nor can they be vested by copyright in the current legislation, but just the vast number of articles, essays and researches from different decades that I found during my writing process, I can only say that works created by AI have puzzled scholars around the world for quite some time and recently the number of these researches just seem to have grown, which is understandable, since AI's have become a part of our everyday life in the 21st century. I look positively ahead, and I would be happy to see the current copyright legislation to be redefined in the coming years and I would surely greet the first legally authorized AI-author with joy if it ever comes to pass.

The legal problems with AI-created works could be researched further and more profoundly in a doctoral thesis, with the focus being on the more demanding theoretical analysis of authorship and copyright theory altogether, but for now I leave the more demanding research for the professors and scholars at law.

¹⁵⁴ Will Robots rule the (artistic) world? A proposed model for the legal status of creations by artificial intelligence systems, p. 20

¹⁵⁵ Generating Rembrandt: Artificial Intelligence, Copyright, And Accountability in the 3A Era – The Human-Like Authors Are Already Here – A New Model, p. 725-726