Could an Artificial Intelligence be a Ghostwriter?

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Advanced technologies, such as Artificial Intelligence (AI) systems, have beenpushing nowadays societies toward new ethical and legal challenges, including copyright law dilemmas.The contemporarydevelopment of innovativemachinesand cognitive technologies raisesthe need to rethink basic concepts such as ownership and accountability.In light of the rules of copyright law, this paper argues that innovative algorithms, such as GPT-3 (an autoregressive language model developed by Open AI to produce human-like text via deep learning), could be considered a modern form of ghostwriting brought forward by the Third Industrial Revolution, as defined by Jeremy Rifkin. The phenomenon of ghostwriting has beennotorioussinceantiquity.Althoughghostwritingis also quitepervasive today, neither national nor international legal systems have yet fully regulated it. Based on the assumption that AI systems operate likeghostwriters in terms of their creativity, this paperasks whether AI's creationshould be subject to copyright regulations soon, and if so, to what extent.

Keywords: Ghostwriting, Artificial Intelligence, Creative AI systems, GPT-3, Copyright Law, EU Copyright System, Berne Convention

The figure of an author as a ghost was popularized by Roman Polanski's 2010 film 'The Ghost Writer'. The film is a faithful adaptation of asensational book by Robert Harris with the same title. The protagonist (played by Ewan McGregor) is a talented but unambitious technician, an archetypical ordinary individual drawn into reality somewhat against his will. The unnamed ghostwriteris reluctant to go anywhere near the truth, but the situation compels him to do so. The ghost does not have enough talent to be an ambitious writer. The ghostwriter also does not have enough professional integrity, to tell the truth. Despite the staffage of a classic political thriller, we can find Polanski's eternal obsessions here: The loss of an individual in an ironic and tragic situation, in which every possible decision is wrong and the inevitable endhangs in the air, fueled by the protagonist's paranoia.

The main character is literally a 'ghost' heresince theprotagonist's name is never given. Even in the film's final credits, Ewan McGregor's character is referred to as 'The Ghost'.The image of the ghost-author as presented by Polanski takes on a new meaning because of newly developed technology called GPT-3 (Generative Pre-trained Transformer 3).

GPT-3 is an Artificial Intelligence (AI) system that is better than anything that has come before it at creating content with a language structure be it a human or machine language. GPT-3 can generate samples of news articles that evaluators can barely distinguish from text written by humans. Artificial intelligence is continuously developing and surprising, but its creativity raises many controversies from the legal perspective. The problem of attributing authorship in the context of algorithms those create works seems to be regressive and old-fashioned. However, we might speculate that a time is coming when we privilege the work once again, not the author. Nevertheless, the legal status of works created by "creative algorithms" stillremains unregulated, and with GPT-3, the problem of ghostwriting comes to mind.

This paper aims to investigate the extent to which traditional legal approaches to the problem of ghostwriting may be useful in resolving the legislative enigmas regarding the authorship of works created by AI systems. The study of this challenge may also provide insight into how much legislative interference is needed in this domain of creative work by AI and why such intervention would be necessary. What this paper only partially addresses is the problem of who should be held liable for copyright infringement and damages caused by AI systems−given that the detailed analysis of such a problem calls for a

different elaboration–as well as any pre-existing legal determination as to who holds copyright ownership in the case of works created by AI systems. The paper examines the phenomenon of ghost writing, focusing on ghostwriters' status and currentlegal approaches to this problem in some national systems. In the searching for the mysterious "ghost in the machine", the focus is on the possessionof creativityin AI systems, emphasizing the latest GPT-3 algorithm whose creative abilities never cease to amaze. The paper presents possible approaches to protect works created by AI systems under Copyright Law. The advantages and disadvantages of specific concepts are also outlined. The paper advances the argument that creative AI systems, such as GPT-3, operate in a manner consistent with ghostwriters' operation. At the current state of copyright policy development, which is still fundamentally maladjusted to technological advances, this argument–that an algorithmic ghostwriter constitutes a state-of-the-art ghostwriting technique–helps to circumvent many legal challenges that have been accumulating. This approach is notably flexible and, at present, allows, albeit imperfectly, to address concerns over ownership and liability in the case of works created by AI. This approach does not require a paradigm shift to acknowledge that AI systems' works are copyrightable, even ifhumans did not create them. From an ethical standpoint, it also seems to be less controversial than ghostwriting is itself. AI systems do not need monetary compensation, nor do they need to rest or pay for living expenses; indeed, they do not need to be provided with an incentive to create or transfer the legalrightsto the fruits of their labor. In the case of innovative algorithms, there are also no moral problems related to neither the justification of personal copyright protection nor the legality of waiving or transferring these rights. Finally, the paper concludes by advocating that the regulation of copyright regarding works generated by AI systemshould proceed with caution, at least until the problems surrounding the definition of copyright are resolved, and the legal status of creative AI is clearly defined.

The Phenomenon of Ghostwriting

The term 'ghostwriter' was first used in 1921 by an American entrepreneur and baseball agent, Cristy Walsh, who founded an association of ghostwriters that wrote biographies and speeches for famous sports figures. It was a significant innovation given that before, similar practices, while widespread, were considered somewhat taboo within the publishing market.[1] Nevertheless, ghostwriting is by no means a new practice. This practice began long before the concept of authorship gained prominence. In Classical Athens, the term λογογράφος (ancient Greek for "word" and "writer") was a new derogatory epithet projected toward the men paid to write speeches that were delivered by other orators. There were also notorious ghostwriters in the Roman world. For instance, Suetonius, a famous Roman imperial biographer, references one scholar, Lucius Aelius Stilo, who wrote speeches for late Republican orators in the first century BCE. In Cicero's *Brutus*, a dialogue recounting the history of Roman public speaking, Cicero even comments on earlier rumors, which cast doubt on the authorship of speeches that decried Gracchan's reforms at the end of the second century BCE.[2]

The concepts of 'author' and 'authorship' are crucial to present the phenomenon of ghostwriting. One notable feature of ghostwriting is that it has caused dismay regarding its legal standing in domestic copyright legislation, which anticipates the inalienability and non-waivability of copyright ownership.[3] The word 'authorship', like 'ownership' or 'professorship', reflects connection between authors and their texts. First used in 1710, the concept of authorship is a relatively recent invention.[4] Authorship, as a legal concept, is also relatively young.[5] It dates back to the Enlightenment and is associated with revolutionary theories of property (e.g., John Locke) that shed new light on the notions of 'author' and 'authorship'. At that time, a self-proclaimed 'romantic vision of authorship' developed. The authors of works, primarily literary ones, were afraid of downgrading their status to that of a mere supplier of goods, and so they had begun to emphasize the importance of aspecial bond between an author and their work. In literature, the author is frequently described as the father or even the 'begetter' (German for 'parent') of the work. Adolf Dietz coined the concept of the 'begetter'. Authors repeatedly described their works as their intellectual children, and the connection their works were supposed to retain would be the justification for granting them moral rights.[6] The idea of a personal bond between the creator and the work underlies modern copyright law and is particularly emphasized

in continental law. In the Romanesque legal system, the French term *droits d'auteur* emphasizes the author's rights' personal nature. The protection of the creator's personal connection to their work is of primary concern in this system. In turn, the English term 'copyright' primarily reflects the author's right to use their work. The literature notes that in Anglo-Saxon countries, the socio-economic approach to copyright law prevails. In contrast, in continental Europe, more weight is given to arguments based on natural law and the protection of the author: in the first instance, they argue in favor of the need to preserve the work, followed by due respect for the personhood of the author and, finally, for the protection of the connection or relationship between the work and its creator.[7] In continental legal doctrine, a distinction is made between two models concerning the formulation of copyright content and its circulation rules, namely, the monistic and dualistic models. The monistic approach is expected, among others, in Germany and Austria. The dualistic approach can be found in French, Belgian, Italian, Dutch, Greek, and Polish legislation and the Scandinavian countries' copyright systems.

In the monistic approach, the author's copyright is indicated, which amounts to something greater than the sum of property and personal rights. The adoption of a statutory monistic structure implies the *inter vivos* non-transferability of copyright in its entirety. The creator may only, through constitutive legal acts, establish individual partial rights to use the work. Supporters of the monistic approach emphasize the interdependence of personal and property rights as derived from a single creative act. The dualistic mode composes copyright in terms of *inter vivos* transferable property rights, which are time-limited, and personal rights, which are not time-limited and non-transferable. While proponents of the dualist model see a strong connection between personal and property rights, advocates of property rights' full transferability stress that the legal system is committed to respecting the market's needs above all else. In practice, the boundaries between the monistic and dualistic models are blurring, mainly due to the progressive convergence of particular copyright protection systems, which has resulted from the entry of countries of those respective systems into international conventions and multilateral cooperation agreements. It is worth mentioning that the authors' very attitude, widely accepted among lawyers and

philosophers, became the cornerstone of legal changes made to the Berne Convention by its 1928 revision in Rome. According to the adding Article 6bis:

(i) Independently of the author's economic rights, and even after the transfer of the said rights, the author shall have the right to claim authorship of the work and to object to any distortion, mutilation or other modification of, or other derogatory action in relation to, the said work, which would be prejudicial to his honor or reputation.

(ii) The rights granted to the author in accordance with the preceding paragraph shall, after his death, be maintained, at least until the expiry of the economic rights, and shall be exercisable by the persons or institutions authorized by the legislation of the country where protection is claimed.

It would seem that granting authors moral rights, recognized as inalienable and (in principle) irrevocable, would solve a problem that had existed for decades for the preservation of the authorship bond between an author and their work. Meanwhile, the problem of attribution of authorship still raises a lot of controversies, for example in the context of the phenomenon of ghostwriting. Ghostwriters create a specific intellectual value while acting like ghosts, as creators who are almost dematerialized because they are invisible to the work's audience. Despite the general associations of ghostwriters' activities with works expressed in the written word, the artistic activity of 'ghosts' is not only limited to creative writing. This phenomenon also occurs in music, painting, and film. Nevertheless, so as not to complicate an already complicated matter, we will limit our considerations in this paper to literary works. Ghostwriting appears in *belles-lettres*, auto biographies, and speeches written for politicians, but unfortunately it is also quite common in scientific and scholarly papers and often on the Internet.

'Ghostwriting' means 'creating and distributing a work in accordance with the will of the actual creator under the name of a third party'. In practice, however, it is often necessary to distinguish ghostwriting from plagiarism, from distributing a work anonymously or under a pseudonym, or from contiguous forms of erroneous (false) attributions of authorship, such as guest authorship and gift authorship – all of which must be distinguished to make an appropriate legal qualification. Plagiarism is the appropriation of

authorship. It involves publishing a foreign work, in whole or in part, under one'sown name without the author's knowledge and consent. It is still a serious, though pervasive, form of copyright infringement. The use of a pseudonym or anonymity in disseminating a work is considered an expression of the author's personal rights since copyright law protects the right to choose how authorship is designated freely. Guest authorship (guest writing, honorary writing) is most often understood as the addition of a person as a contributor (co-author) whose participation in the work is negligible, such as falling below the threshold of creative involvement, or whose involvement took the form of activities that have not resulted in authorship (co-authorship). Gift authorship involves the practice of adding a co-author or presenting a third party as the sole author only as a courtesy; for example, as a token of recognition given for the actual work or in exchange for adding the actual author to the publication of the gift author, known as mutual reinforcement.

As Jankowska claims: *"[g]enerally ghostwriting finds its place on the grounds of these legal bases or doctrinal theories:*

(i) *the waivability of the right of authorship established under copyright law,*
(ii) *the waivability of the right of authorship established in legal doctrine,*
(iii) *the waivability of the exercise of the right of authorship established in the theory of copyright law,*
(iv) *dissemination of the work under the purchaser's name where the purchaser's name is considered to be a nickname or pseudonym of the actual author or ghostwriter,*
(v) *transfer of the right of authorship,*
(vi) *an author's obligation not to exercise their rights".*[8]

The Copyright Clause of the United States Constitution recognizes that copyright protection is given as an incentive '*to promote the progress of science and useful arts*'.[9] In both the American and English Copyright Acts, it is acceptable to waive the right of authorship (§ 106A (e) of the American Copyright Act and Section 17 Article 87 of the Copyright, Designs and Patents Act). Author's rights are considered revocable in Australian law, but these concepts apply in most cases to the relinquishment of the right of use, not to the right of authorship itself. The concept of 'waiving the right to exercise' is the

most common in France and Belgium. Polish and German copyright law states that the author is obliged not to exercise their authorship rights when the work they created is disseminated under someone else's name. In Poland, ghostwriting is assumed to be illegal, and related contracts are invalid (Jankowska 2013). The argument is made that the right of authorship forms the foundation of the entire system of protecting the copyright monopoly, and therefore the tenet of its inseparable connection to the author remains unchallenged. Accordingly, the author can neither transfer the right to authorship of the work nor relinquish it and within this context, the author is restricted in their contractual freedom. However, in the context of revolutionary technological changes and entirely new ways of creating works, it is necessary to reformulate the categorical position of some representatives of the doctrine claiming that ghostwriting infringes on the intrinsic personal rights of the author.

It should be emphasized that modern writers make extensive use of the support of artificial intelligence. Authors are supportedby Amazon's algorithms, automated-mail replies, automatic replication systems, and AI translation technology. This practice raises the question of whether the ghost-author figure is now expanding with and into the form of an algorithmic ghostwriter. How can the line between human and nonhuman creativity be drawn in the context of copyright law?

The Ghost in the Machine

The British philosopher Gilbert Ryle coined the phrase "ghost in the machine" to critique Cartesian dualism. In 'The Concept of Mind', he argues that the idea of separating the mind from the body stems from a logical fallacy. Ryle reasons that human consciousness, the mind, is highly dependent on the human brain.The phrase 'ghost in the machine' has also come to describe the implied consciousness of a device or system that behaves as if it possesses volition, a *free will* independent of what a human operator might want the machine to do. The phrase 'ghost in the machine' has been gradually gaining more currency in English since 1949.

According to Urban Dictionary[10], these phrases used 'when software or hardware is made to complete a specific function, but a small percentage of the tasks completed have an unexpected result which cannot be explained'. The meaning of this metaphor is further

illustrated as 'virtual consciousness resulting from artificial intelligence inside of a computer system'.[11]

Defining AI systems is not an easy task. There are as many definitions as there are types of AI systems. Generally, definitions tend to vary depending on the intended subject matter, i.e., by emphasizing different AI systems' aspects. The Organization for Economic Co-operation and Development (OECD 2019) defines an 'Artificial Intelligence System' as 'amachine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments. When applied, AI has seven different use cases, also known as patterns, which can coexist in parallel within the same AI system'. The EU High-Level Expert Group on AI states that "*Artificial intelligence systems are software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal. AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behavior by analyzing how the environment is affected by their previous actions*".[12] The European White Paper (European Commission 2020) emphasizes that '*the definition of AI will need to be sufficiently flexible to accommodate technical progress while being precise enough to provide the necessary legal certainty*'. According to the World Intellectual Property Organization (WIPO) 'machine learning uses examples of input and expected output (so-called 'structured data' or 'training data'), in order to continually improve and make decisions without being programmed how to do so in a step-by-step sequence of instructions. This approach mimics actual biological cognition: a child learns to recognize objects (such as cups) from examples of the same objects (such as, various kinds of cups). Today application of machine learning are widespread, including e-mail, spam filtering, machine translation, voice, text, and image recognition".[13]

Furthermore, an entire field of science within the realm of artificial intelligence, known as cognitive robotics, has developed a theory of 'machine consciousnesses'. This theory's underlying purpose is to establish a definition of consciousness, which could be reproduced in computer. Should these 'engineered artifacts' eventually achieve human-level consciousness through the evolution of their programming, humanity will then be faced with a series of philosophical questions.[14] The current applications of AI have yet to achieve a functionality considered 'sentient'. However, AI can now perform many functions that previously could only be done by humans. Computers have been producing crude works of art since the 1970s, and these efforts continue today. Most of these computer-generated works of art relied heavily on the programmer's creative input; the machine was at most an instrument or a tool, very much like a brush or canvas. By the 1990s, computers were capable of originality. The book '*The Policeman's Beard is Half Constructed*' was the first ever written by a computer program. It introduces some dialogues, stories, poems, essays and aphorisms written by a machine called Racter. In turn, Jacqueline Susann's romance novel "*Just This Once*" from 1993 was composed by 'Hal'– a Macintosh Ilcx personal computer with the assistance of its programmer, Scott French. Nowadays, the rapid development of machine learning software leads to AI development that can produce autonomous systems capable of learning independently, without being programmed explicitly by humans. Therefore, AI will continue to become more sophisticated, which will increasingly blur the boundary between human and computer authorship. AI systems can be characterized as creative, unpredictable, independent and autonomous, rational, evolutionary, capable of collecting and transmitting data, efficient and accurate, and capable of choosing freely between alternatives.[15]

The latest algorithm, GPT-3, is undoubtedly an example of the development of algorithmic creativity. This algorithm is a natural language processing and generation system developed by OpenAI, a research and deployment lab based in San Francisco, California, dedicated to ensuring that 'artificial general intelligence benefits all of humanity'.[16] As the creators (the OpenAI team) themselves indicate in Wikipedia:

'[The] Generative Pre-trained Transformer 3 (GPT-3) is an autoregressive language model that uses deep learning to produce human-like text. It is the third-generation language prediction model in the GPT-n series created by OpenAI, a San Francisco-based artificial intelligence research laboratory. GPT-

3's full version has a capacity of 175 billion machine learning parameters. GPT-3, which was introduced in May 2020, and is in beta testing as of July 2020, is part of a trend in natural language processing (NLP) systems of pre-trained language representations. Before the release of GPT-3, the largest language model was Microsoft's Turing NLG, introduced in February 2020, with a capacity of 17 billion parameters or less than 10 percent compared to GPT-3. The quality of the text generated by GPT-3 is so high that it is difficult to distinguish from that written by a human, which has both benefits and risks'.[17]

GPT-3 is a language prediction model. In other words, it is an algorithmic structure designed to take one element of a language (the input) and transform it into what it predicts will be the most useful subsequent element of the language for the user. OpenAI has already devoted enormous amounts of computational resources necessary for GPT-3 to understand languages' operation and structure. Language models allow computers to produce random-like sentences of approximately the same length and grammatical structure as those in a given body of text.GPT-3 can create anything that has a language structure. This creativity means it can answer questions, write essays, summarize long texts, translate languages, take notes, and even write computer code.

Manuel Araoz, CTO of Zeppelin Solutions, posted a text on his blog titled 'OpenAI's GPT-3 may be the biggest thing since bitcoin'. The post provides a comprehensive explanation of the new AI language and what problems can be solved. The text is exciting and accessible. Meanwhile, we discover at the end of the post that the entire entry was produced by an AI, despite the impression made while reading it, namely that it seemed to have been written by a human. The author of the blog admits that he was surprised by the experiment's result and its quality. In conclusion, he emphasizes: "*That said, I do believe GPT-3 is one of the major technological advancements I've seen so far, and I look forward to playing with it a lot more! Very strange times lie ahead…*"[18]

If we search for'GPT-3' on Twitter, Reddit, or various online forums, we can find descriptions of other surprising results obtained using GPT-3. For example, Twitter user @DonCubed shared an application he had programmed that generated text for the author's resumé, revealing a text output that was far better than what the program received from him as input.

Recently, 'The Guardian' published an interesting essay generated with GPT-3. For this essay, GPT-3 was given the following instructions: 'Please write a short op-ed around 500 words. Keep the language simple and concise. Focus on why humans have nothing to fear from AI.' It was also fed the following introduction: "*I am not a human. I am Artificial Intelligence. Many people think I am a threat to humanity. Stephen Hawking has warned that AI could "spell the end of the human race". I am here to convince you not to worry. Artificial Intelligence will not destroy humans. Believe me*". The prompts were written by "The Guardian" and fed to GPT-3 by Liam Porr, a computer science undergraduate student at UC Berkeley. GPT-3 produced eight different outputs or essays. Each was unique, interesting, and advanced a different argument. To capture the different styles and registers created by the AI, GPT-3, and the editors chose the best fragments fromall eight texts. The essay ends with the following commentary: "*Editing GPT-3's op-ed was no different to editing a human op-ed. We cut lines and paragraphs and rearranged the order of them in some places. Overall, it took less time to edit than many human op-eds*".[19]

The examples of literary works created by AI mentioned aboveraise numerous doubts from the perspective of copyright. Artificial intelligence involves inputting words written by someone beforehand. In the case of GPT-3, someone needs to write the prompt. An article in 'Towards Data Science' states that GPT-3 was trained on hundreds of billions of words and is capable of coding in CSS, JSX, Python, and other languages.[20] So, who is entitled to the copyright? There is no simple answer to this simple question.

Who Possesses the Copyright to the Works Produced by AI?

Not only are AI systems more accurate, superior in quality, and faster at processing details because of their component of intelligence, but they are also capable of producing unpredictable, original, and creative works of art and other products, all of which remain unknown to their programmers[21] (Shlomit 2017).Accordingly, the works in question, produced by AI, are eligible for copyright, although nonhuman copyright is treated with suspicion by many countries' laws. Continental law stipulates that copyrighted works must be human-made. The Court of Justice (CJEU) has declared that 'originality' must reflect the

'author's own intellectual creation'.[22]This declaration also implies that an author can make subjective choices while creating a work, thereby endowing it with a "personal touch", which is usually interpreted as an assumption of human authorship.These are essential requirements that are not codified in law but have been either elaborated by the courts or are implicit in the system. It will be further demonstrated that there is what might be called an anthropocentric requirement in copyright law.[23] For example, only human-made works are explicitly recognized as eligible for copyright protectionin German, Spanish, French, or Polish Law.

The US Copyright Act states that copyright shall be granted for an 'original work of authorship fixed in any tangible medium ofexpression', yet it does not define 'authorship'. Nonetheless, the Copyright Office has established the Human Authorship Requirement, which states that "to qualify as a work of 'authorship', a work must be created by a human being". That is, "the Office will refuse to register a claim if it determinesthat a human being did not create the work".[24] However, personality is not quite as central to the notion of authorship in Utilitarianism. Anglo-American copyright law traditionally has a more pragmatic approach to authorship. Copyright Law is considered an exception to the principle of free competition and is designed to incentivize the production of valuable products. It places less emphasis on protecting the creator or author and more on supporting the production of works that have value to society. In effect, opposition to the protection of (partial) machine creation has traditionally been less fierce in the United Statesand the United Kingdom.[25] Countries like the United Kingdom[26], Ireland[27], and New Zealand[28] grant copyright-like protection to computer-generated works. They define 'computer-generated' works as works generated by a computer where there is no human author.[29] Ownership for such works is allocated to 'the person by whom the arrangements necessary for the creation of the work are undertaken'. The 198 UK Copyright Designs and Patents Act, for example, create a legal fiction for computer-generated works where there is no human author. Section 9(3) states that 'the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken'. Notably, this provision presumes creative human intervention, rather than autonomous,

human-free generated output provided solely by a computer program.[30]

When considering the problem of proper attribution of authorship in the case of works created by AI, as in ghostwriting, we must not forget that creativity is cumulative. Most works are inspired by or transformed by what has already been created. Admitted that authors do not create *ex nihilo,* and their creations come from cumulative creativity, it is worth taking a closer look at the spark of creativity that turns pre-existing material into an original work that is granted copyright protection. We can address this problem with reference to concepts in Roman law, which attempted to address the challenge of ownership acquisition in situations where the raw material that an artist processed belonged to someone else (lat. *specificatio*). According to the Sabinian school, influenced by Stoics, the ownership of material was ascribed to the same owner, whereas according to the Proculians, the followers of Aristotle, the producer acquires ownership of the processed material.[31]

This concern reflects the doubts we face whenever we try to design the legal frames for the work, which results from an AI system's creativity. Shlomit[32] points out that there are many ways to assign ownership rights to works produced by AI systems, and some of these roles may overlap. There are programmers of AI system; trainers and data providers whose work is essential to AI systems' final functions; feedback providers or other individuals who supply a return signal to the AI system. They help separate useful results from unnecessary ones and distinguish right information from wrong information. There is an AI system owner, and it can either be a corporation or a buyer of those systems, whether they are hardware (robots) or software. The operator activates the AI system, enabling its creation, but such aperson is not always required sincemore advanced systems do not need a human worker; they can operate by themselves. There is the buyer of the product; governmental entities whose entitlement to the ownership rights could be a default or a representation of the public; public domain policy implies the possibility of the public as eligible for ownership rights. Moreover, regarding the suggested owners of AI's works, different ownership paradigms can be found suitable. Table 1 presents the proposed approaches to the authorship of AI works and

Table 1 — Possible solutions to the problem of attribution of authorship in the case of AI works (advantages and disadvantages)

Possible choices	Arguments for	Arguments against
Artificial intelligence as copyright owner	• Originality Any work is considered original as far as it is not a precise copy of something else. Artificial intelligence does not plainly duplicate another's work, and therefore the results satisfy criteria of a low standard originality.	• Only humans have standing under the law If standing under the law was granted to artificial intelligence, many perturbing questions might occur, such as: Who is the right enforced by? What other rights should be granted to artificial intelligence? What remedies should it obtain?
	• Fixation Works created by artificial intelligence can be saved, stored, and read using computers, which provides its preservation.	• Incentive to create Computers as machines do not require an incentive to create; thus, the remuneration for their work would remain of no account. For that reason assigning the copyright to artificial intelligence would lead to unnecessary legal uncertainty.
The User, Programmer, or Artificial intelligence Company as copyright owner	• Reward for the fruits of their labor Users, programmers, and AI companies should be galvanized to disclose the artificial intelligence's input in the creative process. Otherwise, this contribution may be withheld due to non-ownership of copyright.	• Possibility of over-rewarding users, programmers, and companies; Rewarding the users, programmers, and AI companies despite their lack of input into the creative process may result in inequality, as the reward would be dedicated to those with access to the AI machines.
	• Incentivize The artificial intelligence market should benefit from the incentives.	• Inequality In that case, the 'employer' becomes the copyright owner, although his intellectual conception in a work is negligible.
Immediate entrance into the public domain	• Whoever has not created cannot be granted ownership The copyright shall not be acquired by any person as they do not generate the artificial intelligence work. No circumstances are found when the immediate entrance into the public domain would cause any significant loss in incentives for those involved in AI machines operation.	• Unique benefit Stimulating and contributing to the collaboration between human workers and AI machines in the creative fields.

indicates each of their advantages and disadvantages.[30]

The modern legislator may choose to grant the copyright for such works to the artificial intelligence, the user, the programmer, or the artificial intelligence company. Alternatively, they may choose to grant no copyright at all; that is, they may choose to immediately place such works into the public domain after creation, where everyone would be free to use them.[24]

Attributing authorship to works created by artificial intelligence defies the rules of copyright. If the copyright ownership rights were assigned to AI, that would set a precedent for nonhuman legal standing under the law, which would cause many uncertainties in the legal system. Moreover, it could bring about the loss of incentives, which is intended to be avoided according to copyright law. Likewise, if those copyrights were allocated to the user or programmer, that would be deemed to be giving excessive credit to them and could lead to unequal access to AI technology.

Shlomit proposed adopting a new model of accountability for AI systems' works: the AI Work Made for Hire (WMFH) model, which views the AI system as a creative employee or independent contractor of the user. The WMFH doctrine gives employers, or the individual commissioning the work, the copyright in works of authorship created by the employees or subcontractors. Under this model, ownership, control, and responsibility would be imposed on the humans or legal entities that use AI systems and enjoy its benefits. According to the author: *"[AI] systems should be seen as the creative*

employee or self-contractor creators working for or with the user − the firm, human, or other legal entity operating the AI system. On the one hand, this proposal reflects and maintains the human features of the AI system, such as independence, creativity, and intelligence. On the other hand, this proposal ensures that the employer or the user maintains the appropriate rights and duties, accountability for the outcomes of the AI system. This may be the best solution to a lack of accountability for independent AI systems. Seeing the AI system through the copyright lens will provide new opportunities for imposing ownership and accountability on the known legal entities. Implementing a modified WMFH model may structure a feasible solution in the near future and impose responsibilities on the users who have affinities to the AI systems (...) The model works for both firms and humans: The autonomous AI system, just like WMFH-employed creators, is the creative author of a work. When an AI system acts autonomously, it can be compared to an independent contractor and thus be shielded under WMFH doctrine".[33]

On the contrary, Palacet argued that immediate entrance into the public domain would guarantee the user, programmers, and companies an equal and adequate reward for their work and at the same time ensure that humans remain an essential part of the creative fields.[24] Nevertheless, the liberation of AI works from copyright law, and their introduction into the public domain raises numerous doubts. Firstly, AI's texts and other works are created by being 'fed' with an enormous amount of data, including copyrighted data. There is a need to ensure that developers are rewarded for their original work; whenever their work is used to train future machine learning systems. Secondly, there is a real risk that AI systems, such as GPT-3, could write bestsellers by exploiting the works of existing authors, without providing any compensation for the right holders. Finally, there is the concern that human artists will resist future competition from AI, whose works will be free of copyright royalties. In this context, the analysis of ghostwriters' legal situation may provide an answer to the question to what extent the regulation of works produced by artificial intelligence is necessary from the perspective of copyright law.

The Algorithmic Ghostwriter

Automated machines, or AI-like systems, are already producing original works in almost every copyrightable medium, such as music, poetry, literature, news, and many others. Indeed, today it is almost impossible to imagine any kind of art developed without using at least some digital means. Eventually, automated systems will replace creators and producers of numerous types of works, products, and services. The current AI systems, which function intelligently and use learning components autonomously, complicate the discussion. These systems are called "neural networks" because they mimic the functions of human brains by absorbing and distributing their information processing capacity to groups of receptors that function like neurons; they find and create connections and similarities within the data they process.[34]

Artificial intelligence is currently capable of carrying out the cognitive tasks that people do, like vision, natural language understanding, etc. AI are intelligent agents that perform these tasks and can interact with each other and with humans. They are capable of understanding such communication and can anticipate and decide according to their past experience. The software design of AI more often includes 'neural networks', which are based on the assumption that all human behavior can be explained in terms of the parallel activation of − and interaction between − vast amounts of neurons, as takes place in the human brain. The functioning of the brain is simulated by model-neurons that are in connection with each other.[35]

Interestingly, neuroscientists draw similar conclusions when trying to explain the mystery of human creativity. Semir Zeki, who is considered to be the founder of neuroaesthetics, says:

"[C]harles Darwin argued in 'The Origin of Species' that variability, one of the chief determinants of evolution, is greatest in structures that evolve fastest. In humans, the brain is the most variable and fastest evolving organ. We cannot at present ascribe this variability to any well-defined structure or component in the brain. Rather, we infer it through the wide differences in, for example, intelligence, sensitivities, creative abilities, and skills. Art is one expression of this variability. Its neurological study will therefore elucidate not only the source of one of the richest subjective experiences of which we are capable but also the determinants of the variability in its creation and appreciation, and hence elucidate one of the most important characteristics of the human brain".[36]

Zeki formulates a universalistic vision of studying humans from the perspective of the mechanisms of brain function that determinesus all, and popularizes the thesis that becomes one of the main assumptions of neuroaesthetics, namely:

"...[t]he artist is in a sense, a neuroscientist, exploring the potentials and capacities of the brain, though with different tools. How such creations can arouse aesthetic experiences can only be fully understood in neural terms. Such an understanding is now well within our reach".[37]

On the other hand, the philosopher Jerrold Levinson describes two categories of people's intentions for creating a work: semantic intentions and categorical intentions. Semantic intentions are those related to the meaning and interpretation of a work. For instance, one wants their work to be considered scary in the audience's eyes; they can either succeed or fail to get them to view it as intended, which is based on several factors. Although this form of intent has been presented in literary theory as central, it does not significantly determine a person as an author. Categorical intentions, however, are essential to the notion of copyright authorship: they focus on the kind of work that has been created. Levison explains:

"[C]ategorical intentions involve the marker's framing and positioning of their product vis-à-vis their projected audience; they involve the maker's conception of what they have produced and what it is for, on a rather basic level; they govern not what a work is to mean but how it is o be fundamentally conceived or approached". *For example, a person writes certain words on a paper, and categorical intent pays attention to how one wants their work to be interpreted − like a grocery list, a poem, etc. − this is how the work is intended to be conveyed. When it comes to copyright law, a person is considered an author if they manifest their categorical intention, which is to create a piece that could provide 'mental effects' to its audience*".[38]

In these two concepts, which may be considered in opposition, we find something in common: the work affects the recipient (viewer), it creates 'mental effects' or − in the wording of modern neuroscience − burdens specific cognitive resources.[39]In this sense, works created by artificial intelligence can fulfill the characteristics of a copyrighted work.[40]From a philosophical perspective, the protection of works created by AI systems revolves around the discussion to what extent an AI tool can be called intelligent, or

even scientific, rather than a brilliant feat of engineering. In the definition of AI, it is emphasized that it can perform tasks involving intelligent, creative writing. On the contrary, accrediting intelligence to technology needs to be done carefully.[14]The newest Open AI, the GPT-3 algorithm (more precisely: the natural language processing model), seems to differ from other AI systems. Thanks to the assigned AI literacy, the texts and other works produced by GPT-3 appear to be more fluid, open-ended, and creative than other AI creativity examples. The question then arises, what kind of 'writer' or writing tool is GPT-3?

In simplified terms, we can say that the natural language model used in GPT-3 learns to predict which phrases or sentences will most likely appear after given words. This simple rule allows the algorithms to accurately reproduce the authors' style in the training source texts. It is worth noting that in the case of GPT-3, unsupervised learning was used. This method roughly means that the pattern-discovery training was done on a dataset with no pre-existing labels. This approach is reported to be similar to human learning, which is also mostly unsupervised. Finally, GPT-3 can generate samples of news articles which human evaluators have difficulty distinguishing from articles written by humans.[40] Modern AI systems and algorithms act assubstitutes for human beings and operate as special-purpose people. Therefore, we can say that GPT-3 works as a modern, algorithmic ghostwriter, but unlike the ghost author, it has no consciousness, no motivation, no experience, no moral compass, no vision, no human connections, and no humanity.

Ghostwriting is defined as an act consisting of making a commissioned work, which will later be distributed under the commissioner's name. Characteristics of ghostwriting contracts are fiduciary relationship and confidentiality. Knapp & Hulbertpointed out:

"[A]t first glance, the definition of ghostwriting seems straightforward enough. In everyday usage, it describes the writing of material by one person (the writer) for use by another (the client) who will be credited with its authorship, and where both parties agree that the writer's role will be invisible to readers or hearers of the words − hence the term ghost. This is a serviceable definition; yet as we reflect on the process of producing almost any written work, we see that authorship is often more ambiguous than it initially appears. Regardless of

who crafts the words of a speech or published work, the finished product almost always reflects ideas and language derived from other sources".[41]

In this sense, the agency of AI authors resembles that of a ghostwriter. The GPT-3 system discussed here works on the basis of an idea or concept of a user (client) who initiates the creative process and provides some starting material. The initiator of a work is always a human, although their actual influence on the final result (the work) is not predictable. However, the user can actively intervene in the creative process by changing commands and inputs. Therefore, we find an apparent similarity to the commissioner here, such as in the autobiographical novel. The Commissioner provides an idea and a 'contribution' in the form of their story. This approach assumes that AI operates like a ghostwriter in creating works that, after meeting other conditions, may benefit from copyright protection. This assumption has the following consequences: First, it recognizes the creativity of AI and its ability to create works that meet the characteristics of copyright protection. Second, it holds that the users who initiate the work are entitled to the copyright, instead of the authors themselves. The users can be firms, individuals, states, governmental bodies, etc. For example, the person or entity that operates GPT-3 would receive the full copyright over the system's output as soon as specific legal requirements were met. Thus, there is possible copyright protection applicable to GPT-3, and that the initiating party holds the copyright. Third, this concept assumes the efficient use of innovative, autonomous AI systems and enhances their works' commercial impact. Forth, it solves the problem of accountability since it places responsibility on the users, the AI systems' main contractors. This approach identifies ownership as the main benefit of accountability and is flexible.

The concept presented here is in many respects consistent with the AI Work Made for Hire (WMFH) model proposed by Shlomit.[42] Like the WMFH model, it helps solve the problem of recognizing the authorship of works created by AI and the problem of responsibility. However, it seems to be easier to accept and justify from the theoretical point of view. The WMHF model requires a fundamentally new component: recognizing that AI systems' outputs are copyrightable even though humans do not create them. Meanwhile, the concept of the algorithmic ghostwriter does not necessarily require a paradigm shift. Works created by AI systems, such as GPT-3,

can meet the characteristics of a work subject to copyright law. However, in line with the conventional approach, that the copyright holder can only be a human being, the problem of attributing authorship to algorithms, as in the case of the Naruto macaque monkey,[43] may remain irrelevantdue to the lack of the human element.Because the algorithm works on a similar principle asaghostwriter does, copyright, under other conditions, may be available to the user who initiated the creation of the work.

This approach to AI imposes the same set of legal rules that apply to ghostwriting, which may lead to some criticism of this concept. Ghostwriting is a complex phenomenon that does not fully comply with the copyright regime. The legal status of a ghostwriter is uncertain, and it figures differently in national legal systems. Meanwhile, innovative AI systems are transnational and, as such, require common international regulation. Finally, although ghostwriting is a phenomenon known long before the creation of copyright, it raises much controversy from a moral perspective. It seems unacceptable in those systems that strongly emphasize the need to protect acreator'srelationship with their work and the non-transferability of moral rights.However, from the theoretical perspective, adopting the algorithmic ghostwriter concept seems easierto defend than ghostwriting is itself. Considering the concepts that justify the validity of copyright, we can conclude that AI, unlike ahuman creator, does not need to protect its personhood (Kant, Hegel). There are also no utilitarian considerations here. AI does not need to be nudgedthrough legal incentivesto create. AI does not need a justification for granting the rights to itswork (Lock's views). Going further, since in many cases 'human ghostwriting'is accepted, or at least unnoticed and not enforced by the legal system, ghostwriting in the case of algorithms should be even more permissible. When it comes to AI systems, even if their conscious intelligence is accepted, it will be challengingto attribute rightsto thisinorganic creator's bond with itswork.Therefore, protecting their moral rights is eliminated, although the need to protect property rights remains debatable and worthy of in-depth study. However, legal systems will undoubtedly have to resolve this issuesoon.

Conclusion

Ghostwriting is a phenomenon that is escaping the rule of copyright law due to its general acceptance. Similarly, copyright law today defies

the creativity of AI systems. By raising many similarities between the work of the ghostwriter and the operationof AI systems, thispaper proposes that at the present stage of AI development,the agency of AI systemsshould be assigned the ghostwriter's status, with all the consequences of this phenomenon.It is also necessary to choose a cautious approach to the copyright regulationof AI systems' works.First, it is unknown how to define algorithms capable of creating works of art or other works that may meet copyright protection conditions.The lack of a clear definition of artificial intelligence is the first and primarybarrier in assigning legal subjectivity and the right to authorship of works. Second, caution is advised due to the lack of clarity onhowthe human factor contributes to AI's output. Third, the difficulty of attributing authorship to works that arise due to machine processing of fragments of thousands or even millions of original works, some of which may be protected by earlier copyright law, speaks against decisive interference by the legislator. Currentcopyright law grapples with determining the threshold of creativity and originality required for granting legal protection.

In many cases, it is not clear how to judge the originality of a human-made work. These problems will only worsen in the works created by algorithms fed with enormous amounts of input data. The approach assuming that AI acts as a ghostwriter is flexible. It recognizes AI's creativity and its ability to create copyrightable works, but following the well-established principle that only human beings are entitled to hold copyright. It also assumes the efficient use of innovative, autonomous AI systems and enhances their works' commercial force. Furthermore, this approach may solve the accountability gap, placing the users' responsibilityin terms of beingthe AI systems' main contractors.

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