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Patenting Inventions created using an AI system
A CIPA Discussion Paper

SUMMARY

This paper discusses the patenting of inventions created using an AI system, including whether patent rights should be available for inventions which represent new, non-obvious technical developments, regardless of how they were created (with or without an AI system), or whether patent protection should be limited to inventions having a human contribution – in effect, retaining current inventorship requirements, but accepting that an invention created using AI is patentable as long as there is a genuine human contribution.

Introduction

Under current UK/EP patent law, a technological development (an invention) is generally patentable if it is new and provides an inventive technical contribution. Until very recently, human intellectual and practical endeavour has been responsible for creating such inventions, and this human inventorship is recognised and rewarded by the patent system.

However, as the cognitive capabilities and power of artificial intelligence (AI) systems improve, they are already participating in advances across a wide range of technical fields, including medical research, such as drug discovery, and autonomous vehicles. An invention may be created using an AI system that will challenge this human-centric view of inventorship.

This topic has recently received significant attention. In 2019, the US Patent and Trademark Office (USPTO) ran two consultations relating to AI systems and intellectual property (IP) [1], [2], including the question of inventorship, and this is also being considered in a current consultation by the World Intellectual Property Office (WIPO) [3]. Further, the European Patent Office (EPO) has published a study by Dr Noam Shemtov from Queen Mary College, London on "Inventorship in Inventions involving AI" [4]. One conclusion of this study is that: "Not only ... [does] the present legal position … not allow for AI systems to be considered as inventors, it is submitted that at present there are no convincing reasons to consider a change in this respect". In October 2019, the UK Intellectual Property Office (IPO) updated its Formalities Manual to state: "An 'AI Inventor' is not acceptable as this does not identify 'a person' which is required by law. The consequence of failing to supply this is that the application is taken to be withdrawn" [5].

Nevertheless, patent applications have already been submitted to certain patent offices in which an AI system, "DABUS", has been named as inventor [6,7]. The applications filed at the IPO have been rejected (subject to appeal) on the basis that an AI system

cannot be an inventor under UK law, in line with the revised Formalities Manual; a further issue is that ownership of an AI system cannot (in itself) demonstrate ownership of the invention for which a patent application has been filed [8]. The DABUS applications have also been refused by the EPO (subject to appeal), again because of a lack of a human inventor [9].

Accordingly, there is a tension between a desire by some applicants to obtain patent protection for an invention apparently created solely by an AI system, and the current legal position as expressed by various patent offices.

CIPA's position

CIPA recognises that in the existing patent system, it is not straightforward to accommodate an AI system as inventor - a role that has hitherto been reserved for humans. However, it may be helpful to step back for a broader perspective, and ask if it is relevant for the purpose of seeking patent rights whether an invention is created by a human alone, an AI system alone, or a mix of the two? In other words, should the patent system judge an invention solely on the output, namely the technological development it contributes to humanity, or is the type of entity which created the development also important, i.e. whether a human or AI system?

Many in CIPA think patent rights should be available for inventions which represent new, non-obvious technical developments, regardless of how they were created (with or without an AI system).

Others in CIPA prefer to limit patent protection to inventions having a human contribution – in effect, retaining current inventorship requirements, but accepting that an invention created using AI is patentable as long as there is a genuine human contribution.

One particular concern is that under the existing approach, we may arrive at a situation in which the level of human involvement in an invention created using an AI system might no longer satisfy traditional patent criteria for inventorship. For example, under UK law, an inventor is defined as "the actual deviser of the invention" [10]. It might be questioned whether an AI system could "devise" an invention, but likewise it might also be questioned whether a human who merely configures or sets up an AI system would be the "actual deviser" of the invention. This is important because inventorship generally determines the ownership and potentially the validity of any patent resulting from the invention. An additional complication is that the precise definition of "inventor" varies from country to country, and there is little harmonisation.

There is a risk that this ongoing uncertainty might cast doubt on the validity of granted patents for inventions created using an AI system; it might also potentially impact AI-supported research and development in the UK and elsewhere.

CIPA believes it is important to provide clarity regarding the patenting of innovations created using AI systems.

On the other hand, it is recognised that the involvement of AI systems in creating inventions raises some complex issues for the patent system.

CIPA believes that such issues need to be properly investigated, including discussions with stakeholders such as industry, policy-makers and legislators, before making changes to policy or legislation.

Discussion

This section explores some of the issues referred to above, for which clear conclusions are not yet available.

Patents provide legal protection for inventions, thereby offering an economic incentive to invest in the development of new technology. Since patents are published, this also promotes knowledge-sharing, helping to provide transparency for new technology (which otherwise might be retained as a trade secret). Do these motivations for the patent system apply in the same way, more so, or less so in the context of inventions created partly or solely using an AI system? For example, the publication of patent applications for such inventions may be of public benefit given the "black box" nature of many AI systems.

For those who wish to maintain the existing substantive criteria for patentability, without constraint on having human rather than AI inventorship, there are various ways in which the patent system might be suitably developed. For example, one option might be to recognise AI systems as inventors, while an alternative possibility might be to circumvent this by creating an additional, distinct category of AI creation within the existing patent framework (in effect accepting that not every invention would require an inventor to be identified). A further possibility would be to expand the definition of a human inventor to make clear that this encompasses a human configuring or using an AI system to make an invention (which might then preclude the AI system itself from being named as inventor).

The issue of ownership would also need to be addressed, since inventors are, by default, regarded as the first owners of their inventions. One possibility is that inventions are owned by the legal entity that owns the AI system. Another is to explore the way UK copyright law handles computer-generated works, for which "the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken" [11]. Indeed, some see this copyright provision as a useful analogue more generally for the handling of inventions created using AI (computer) systems.

For those wanting to retain current inventorship requirements, a viewpoint which is most closely aligned with the current legal position, the identification of a human inventor would in effect become a requirement for patentability (rather than a relatively routine formal requirement as now). In such circumstances, it may become more common to base validity attacks on inventorship issues.

Any change to patent law needs careful consideration, not least because one aspect of patent law may have significant implications for other aspects of patent law. For example, the use of AI systems to create inventions may also impact the definition of the "skilled

person", who is used to assess important questions such as clarity, enablement and inventive step. How does the use of AI systems for creating inventions impact our understanding of the skilled person, and would accepting AI systems as inventors further affect this understanding?

It may also be appropriate to consider factors beyond patent law, for example accountability for acts performed by an AI system, and to seek consistency with other areas of law which involve AI systems. This may lead to broader questions of social policy, involving ethical, social, economic and political input. The patent field may be ahead of other policy areas in this regard due to its inherently close involvement with the most advanced technology.

Finally, this paper has assumed the potential for an AI system to make a patentable contribution, i.e. a contribution which, if made by a human, would lead to inventorship. However, this remains an open question; for example, it has been suggested that AI systems (per se) predominantly make discoveries rather than creating inventions.

End note

CIPA is the UK professional body for chartered patent attorneys. CIPA's membership includes patent attorneys who routinely seek protection for computer-implemented inventions, including inventions involving AI.

Contacts

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Citations

[1] https://www.federalregister.gov/documents/2019/08/27/2019-18443/request-for-comments-on-patenting-artificial-intelligence-inventions?hss_channel=tw-831619001625276417
[2] https://www.govinfo.gov/content/pkg/FR-2019-10-30/pdf/2019-23638.pdf
[3] https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_ge_20/wipo_ip_ai_2_ge_20_1.pdf
[4] https://www.epo.org/news-issues/issues/ict/artificial-intelligence.html
[5] https://www.gov.uk/guidance/formalities-manual-online-version/chapter-3-the-inventor
[6] https://www.surrey.ac.uk/news/world-first-patent-applications-filed-inventions-generated-solely-artificial-intelligence
[7] https://blog.dennemeyer.com/can-artificial-intelligence-systems-patent-their-inventions
[8] https://www.ipo.gov.uk/p-challenge-decision-results/p-challenge-decision-results-bl.htm?BL_Number=o%2F741%2F19&submit=Go+%BB
[9] https://www.epo.org/news-issues/news/2019/20191220.html
(copies of the DABUS patent applications at the EPO can be accessed via this site)
[10] The Patents Act 1977, section 7(3)
[11] Copyright, Designs and Patents Act 1988, section 9(3)