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Dear Sirs

Re: Open consultation Artificial intelligence and intellectual property: call for views

Patents

1. What role can/does the patent system play in encouraging the development and use of AI technologies?
Generally, patents shall be granted for any inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application. Hence, the patent system directly encourages the development of AI technologies, including CIIs, AI inventions and CGIs. Use of AI technologies, for example as a tool, may contribute to the development of inventions in other fields of technology and is hence the patent system indirectly encourages the use of AI technologies.

2. Can current AI systems devise inventions? Particularly:
(a) to what extent is AI a tool for human inventors to use?
AI is already a tool for human inventors to use, with adoption to differing extents in all fields of technology.
(b) could the AI developer, the user of the AI, or the person who constructs the datasets on which AI is trained, claim inventorship?
Potentially.
Generally, the inventor is the deviser of the inventive concept of the claimed subject matter. However, it is the inventive concept of the granted and valid claims subject matter that is deterministic. Any natural person may claim inventorship but only the natural person who devised the inventive concept thus has a right to be mentioned as an inventor. In this regard, the AI developer, the user of the AI and the person who constructs the datasets on which AI is trained have analogues in all other fields of technology and thus no special treatment is required. Hence, the AI developer, the user of the AI, or the person who constructs the datasets on which AI is trained may claim inventorship and have the right to be mentioned as an inventor if they devised the inventive concept.
A natural person involved in the conception and reduction to practice of an AI invention can contribute in several ways. For instance, the person may design a new way of gathering or specifying data and building a data set that enables a better result. The person may also

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design a new algorithm or adapt an existing algorithm to utilize the data set in a new way or to combine the results of both AI and non-AI components of a system to achieve a unique result. The person may also find a unique way to apply AI to leverage the data, inputs and outputs in a system to achieve a unique objective within a specific application. In other words, the person may conceive of a hitherto unrecognised, unobvious technical problem which AI can be deployed to solve.

For example, the person may design a method to gather data from different sources, format that data and assemble it in a normalized data set for the AI algorithm. The person may, for example, design a new classifier or model that when applied in an AI algorithm provides greater accuracy. The person may, for example, assemble multiple parallel AI algorithms to obtain multiple inferences to find an average that is applied within an application.

(c) are there situations when a human inventor cannot be identified?

No.

Generally, to identify an inventor, the inventive concept of the claimed subject matter must firstly be identified, or if that cannot be readily done, construed. The inventor is the person who devised the inventive concept. Devising is an intellectual activity and thus the inventor is a natural person.

How can a machine 'devise' something? Further, even in the case where AI is simply used as a tool to discern unpredicted or unexpected but useful patterns in large data-sets that are unavailable to a human being, the question of devising the inventive concept is outside of the AI.

3. Should patent law allow AI to be identified as the sole or joint inventor?

No.

The basic principle of the patent system is to that patents are granted to natural persons as rewards for inventive contributions of benefit to society. Inherent in the patent system is the requirement for the inventors to be natural persons. Variation of this requirement demands a review of the basic principle of the patent system and in turn, the more general principle of ownership of property. Thus, patent law should not allow AI to be identified as the sole or joint inventor.

In any event, until AI is capable of inventing without being assisted or guided by a natural person (i.e. 'true AI'), both AI inventions and inventions using AI require at least one natural person to be named as an inventor and should not require that the AI be named. That is, within the current state of the art, the AI being used should be considered a 'tool' in the inventing process. That being said, it is unclear if an AI entity owned by one company (e.g., a third party AI system or service) that is used by a person employed by another company (i.e., an inventor using the third party AI system or service) to invent something should affect the ownership of the underlying invention, unless that AI entity is acting as more than a tool.

4. If AI cannot be credited as inventor, will this discourage future inventions being protected by patents? Would this impact on innovation developed using AI? Would there be an impact if inventions were kept confidential rather than made public through the patent system?

No.

Natural persons will continue to be named as inventors, since this is the requirement while also beyond the limit of the current state of the art in AI.

Development of innovation using AI is not relevant since the AI is merely a tool and hence inventorship is not at question.

The decision to keep an invention confidential is unlikely to be determined by inventorship. Rather, such a decision may be commercial or in view of patentability of the invention.

5. Is there a moral case for recognising AI as an inventor in a patent?
No.
Questions of morality may not be answered in respect of a machine. Hence, there is no moral case for recognising AI as an inventor in a patent.

6. If AI was named as sole or joint inventor of a patented invention, who or what should be entitled to own the patent?
If, somehow in view of (3), AI were named as sole or joint inventor of a patented invention, the proprietor is the natural or legal person who made the necessary arrangements for the devising of the invention by the AI.

7. Does current law or practice cause problems for the grant of patents for AI inventions in the UK?
Yes.
Grant of patents for CIIs in the UK is already prejudiced by current practice at the UK IPO, in view of the case law, such that grant of patents for CIIs for the UK is more preferably achieved via the EPO. Grant of patents for AI inventions (CIIs, AI inventions or CGIs) is prejudiced to at least the same extent.

8. Could there be patentability issues in the future as AI technology develops?
No.
Patentability is codified: grant of a patent for an invention requires that the invention is new, involves an inventive step, is capable of industrial application and that grant of a patent is not excluded. Development of AI technology cannot change these requirements.
Nevertheless, development of AI technology may affect assessment of whether the invention is new and/or involves an inventive step by identifying more relevant prior art, for example.

9. How difficult do the list of excluded categories in UK law make it to secure patent protection for AI inventions? Where should be the line be drawn here to best stimulate innovation?
The difficulty is not with the list of excluded categories but instead with the interpretation thereof in the case law and hence current practice at the UK IPO. Stimulating innovation requires the establishment of new case law and hence practice that affords protection to CIIs generally and AI inventions (CIIs, AI inventions or CGIs) specifically.

10. Do restrictions on the availability of patent rights cause problems for ethical oversight of AI inventions?
Publication of applications relating to AI inventions simultaneously allows for oversight of the AI inventions but also informs the public. Working of the AI inventions by the public may be without oversight.

11. Does the requirement for a patent to provide sufficient detail to allow a skilled person to perform an invention pose problems for AI inventions?
No.

The requirement of sufficiency of disclosure applies equally in all fields of technology. Whether an invention is sufficiently disclosed depends on the facts particular to the field of technology for the invention and assessment is made based on established case law and/or practice. However, for inventions relating to AI, such case law and/or practice has as yet to be established and hence this poses problems for such inventions.
Nevertheless, AI inventions are unique in that they typically operate in systems that process massive amounts of data and apply complex mathematical concepts. It is not particularly settled how much of the data set should be disclosed (or can be disclosed due to privacy concerns), how much detail of the actual algorithm(s) should be disclosed (e.g., when many AI algorithms are considered “black boxes”), or how many examples of the results should be disclosed. Moreover, since many AI systems adapt, change and evolve as more and more data is fed into the system, the patent system is unable to account for these changes when the disclosure is a snapshot of the system at the time you file the application. Patent authorities should consider whether data deposits or post-filing data could or should become a part of patent applications for AI inventions. As a minimum, sufficiency requirements should be met where the specification enables those skilled in the art to reconstruct their own version of the data set, although in these circumstances there is a relationship between the extent to which a data-set is defined and the reproducibility and therefore allowability of the claimed subject-matter. As an aside, FICPI perceives there may be a need for a new form of protection for data that facilitates data disclosure and sharing whilst preserving its intrinsic value to its creator.
Patent applications for AI inventions should be treated for enablement like other inventions. To the question of unpredictability, like with other inventions, those drafting patent applications related to AI should ensure that the specification describes how to make and use the AI invention to the extent that a person skilled in the art can replicate a system that has the ability to generate such unpredictable results. The unpredictable results could themselves be an invention, but that should be considered a separate invention requiring a separate specification that demonstrates an inventive aspect in the previously unpredicted result. As mentioned in our previous answer, unpredictable results cannot form the basis for a granted claim that relies on a definitive result as such, but may nevertheless support claims to a method for generating a result.
Finally, it should be noted that AI inventions can differ greatly as to where in the system is the point of invention and there is no simple answer to how best to comply with the enablement requirement.

12. In the future could there be reasons for the law to provide sufficient detail of an AI invention for societal reasons that go beyond the current purposes of patent law?
No.
AI is no different from other fields of technology and there are no reasons for the law to provide sufficient detail of inventions in other fields of technology, for example biotechnology, for societal reasons that go beyond the current purposes of patent law.

13. Does or will AI challenge the level of inventive step required to obtain a patent? If yes, can this challenge be accommodated by current patent law?
No.
The level of inventive step required to obtain a patent is based on established case law. This level of inventive step is agnostic of the field of technology. Hence, AI does not and will not

challenge the level of inventive step required to obtain a patent – unless established case law applicable to all fields of technology is involved.

14. Should we extend the concept of "the person skilled in the art" to "the machine trained in the art"?
No.
Since the inventor is a natural person, the person skilled in the art is unchanged.

15. Who is liable when AI infringes a patent, particularly when this action could not have been predicted by a human?
Analogous to the proprietor being the natural or legal person who made the necessary arrangements for the devising of an invention by AI, the infringer is the natural or legal person who made the necessary arrangements for performing an infringing act.

16. Could there be problems proving patent infringement by AI? If yes, can you estimate the size and the impacts of the problem?
No more than in other fields of technology.

Yours faithfully
For and on behalf of Appleyard Lees IP LLP

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