

November 6, 2019

The Honorable Andrei Iancu
Under Secretary of Commerce for Intellectual Property and Director
U.S. Patent and Trademark Office
Mail Stop: Comments—Patents, Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Via email: AIPartnership@uspto.gov

Re: Request for Comments on Patenting Artificial Intelligence Inventions

Dear Director Iancu:

Seiko Epson Corporation (Epson) thanks the United States Patent and Trademark Office (USPTO) for the opportunity to comment on patenting of Artificial Intelligence (AI) inventions.

Epson is a global corporation that develops, manufactures, and sells printers with a wide variety of applications for home, office, commercial, and industrial use, an extensive lineup of projectors, watches and other wearable devices, robotic systems, and crystal and semiconductor devices.

Epson has been filing over 1,000 United States patent applications yearly since the early 2000s and, considering the predictable future increase of AI inventions, expects to file many patent applications also for AI inventions, particularly for inventions created as the result of a natural person using AI (AI-use inventions).

We have attached our responses to the questions asked by the USPTO in its request for public comments.

Sincerely,



Toshihiko Kobayashi
General Administrative Manager
Intellectual Property Division
Seiko Epson Corporation

Attachment: Seiko Epson's responses to questions asked by the USPTO in its request for public comments on AI inventions

Seiko Epson's responses to questions asked by the USPTO in its request for public comments on AI inventions

Question 1

Inventions that utilize AI, as well as inventions that are developed by AI, have commonly been referred to as "AI inventions." What are elements of an AI invention?

For example: The problem to be addressed (e.g., application of AI); the structure of the database on which the AI will be trained and will act; the training of the algorithm on the data; the algorithm itself; the results of the AI invention through an automated process; the policies/weights to be applied to the data that affects the outcome of the results; and/or other elements.

Response

All the examples provided by the USPTO could be elements of an AI invention. However, elements other than these examples might be uncovered during future progress in, and greater use of, AI technology. Therefore, we hope that rather than the USPTO making a hard determination on AI invention elements at this time, the USPTO instead repeatedly review this issue, and publish example elements of AI inventions in examination guidelines and the like. In the specific case though of AI inventions conceived solely by AI, without any contribution by a natural person, such inventions are not inventions by a natural person, so should not be recognized as an AI invention element protectable by patent rights.

Question 2

What are the different ways that a natural person can contribute to conception of an AI invention and be eligible to be a named inventor? For example: Designing the algorithm and/or weighting adaptations; structuring the data on which the algorithm runs; running the AI algorithm on the data and obtaining the results.

Response

If the acts in the examples provided by the USPTO were performed by a natural person, then the natural person should be eligible to be a named inventor.

However, as can be seen from the examples in question 1, AI can potentially contribute to the creation of inventions in a variety of ways, so we urge that the level, or type of, contribution required by a natural person to recognize the natural person as an inventor, be determined cautiously with rigorous debate on the issue.

This being said, AI inventions created solely by AI, without any contribution by a natural person, should be deemed as inventions with no inventor, even if the inventions meet the non-obviousness standard required to receive a patent right.

Question 3

Do current patent laws and regulations regarding inventorship need to be revised to take into account inventions where an entity or entities other than a natural person contributed to the conception of an invention?

Response

According to 35 U.S.C. 100, Definitions (f), "The term "inventor" means the individual or, if a joint invention, the individuals collectively who invented or discovered the subject matter of the invention." Based on present patent law, AI cannot be an inventor, because AI is not a natural person, and therefore cannot be considered as an "individual."

In contrast, the example provided by the USPTO includes the wording "an entity or entities other than a natural person," which encompasses AI. If the definition of inventor is changed in this way, and as a result AI inventions that are solely conceived by AI, without any contribution by a natural person, become subject to protection by patent rights, then the possibility arises of AI being used to mass produce patent rights, which could cause chaos in the business community. It is also possible that a small number of entities that possess superior AI could gain market dominance using the patent rights generated by their AI. Further, if AI is treated in the same way as a natural person with respect to intellectual property rights, this could also impact how AI should be treated with respect to other property rights, and might impact the broader discussion of whether a robot with AI intelligence could be considered a legal person.

Based on these concerns, we believe patent law should not be changed to encompass "an entity or entities other than a natural person" as an inventor. Accordingly, AI inventions, even if superior, should not be subject to protection by patent rights if created solely by AI, without any contribution by a natural person, because no natural person is an inventor

Before there is any change in patent law that might recognize "an entity or entities other than a natural person" as an inventor, we hope for a healthy discussion on how the above-mentioned concerns will be addressed.

Question 4

Should an entity or entities other than a natural person, or company to which a natural person assigns an invention, be able to own a patent on the AI invention?

For example: Should a company who trains the artificial intelligence process that creates the invention be able to be an owner?

Response

1. As we stated in our response to question 3, "an entity or entities other than a natural person" should not be considered as an inventor. Therefore, AI inventions solely created by AI, without any contribution by a natural person, will have no inventor, so cannot satisfy requirements for filing a patent application, should not be protected by patent rights, and should instead be considered as ownerless.

2. A natural person who contributed to completion of the AI (such as the creator of the AI algorithm or the AI trainer) can be considered an inventor of an AI invention to which the natural person contributed, and a company that received transfer of the right from the natural person by, for example, employment agreement, can be the owner of the patent right.

However, in the case of an AI-use invention (that is, an AI invention that was created as the result of a natural person using AI), inventorship should be determined not only by taking into account the contribution by the natural person who completed the AI, but also any relevant contracts between concerned parties. For example, if the AI user (or the AI user's employer) and the natural person who contributed to completion of the AI (or the employer thereof) are bound by a contract with a provision that any AI-use invention belongs to the AI user (or the AI user's employer), then the AI user should be considered the inventor, rather than the natural person who contributed to completion of the AI, even if the AI has superior functions and all that the AI user did was provide the input data that resulted in an AI-use invention. Similarly, depending on how ownership of AI-use inventions is treated in relevant contracts between concerned parties, the AI user (or the AI user's employer) could be the owner of an AI-use invention, and not necessarily the natural person who completed the AI (or the employer thereof).

On the other hand, we are concerned that owners of AI might abuse their power over the AI users or their employers, and force them to enter contracts that recognize the natural person who completed the AI as the inventor of all AI-use inventions, and the owner of the AI as the owner of the all AI-use inventions. We

ask the USPTO to formulate legislative and policy proposals that will protect AI users from such abusive practices.

Question 5

Are there any patent eligibility considerations unique to AI inventions?

Response

The USPTO should examine and grant patent rights for AI inventions using the same standards as for computer-implemented inventions.

However, AI inventions created solely by AI, without any contribution by a natural person, have no inventor, so do not meet requirements for filing a patent application, and so should not be eligible for patents rights.

Question 6

Are there any disclosure-related considerations unique to AI inventions?

For example, under current practice, written description support for computer-implemented inventions generally require sufficient disclosure of an algorithm to perform a claimed function, such that a person of ordinary skill in the art can reasonably conclude that the inventor had possession of the claimed invention.

Does there need to be a change in the level of detail an applicant must provide in order to comply with the written description requirement, particularly for deep learning systems that may have a large number of hidden layers with weights that evolve during the learning/training process without human intervention or knowledge?

Response

This response is for both Questions 6 and 7.

As mentioned above, AI could become involved in a variety of inventions from a variety of viewpoints. Disclosure requirements and enabling requirements should be set in accordance with the respective technological field of each AI invention.

For example, speaking specifically about AI-use inventions, these should be examined using similar examination standards as for computer-implemented inventions. Therefore, application specifications and drawings should recite subject matter of the invention sufficient to satisfy disclosure and enabling requirements for computer-implemented inventions.

Specifically, computer-implemented inventions have no requirement for disclosure of specific configuration of a CPU or processor, or details of the controlling algorithm. We believe that similarly AI-use inventions should have no requirement for disclosure of the entire AI configuration or algorithm.

However, in contrast to the use of common programs that run standard CPUs and processors, AI is often used without a clear understanding of the underlying algorithm that is the basis of the output. Therefore, AI-use inventions should have a disclosure requirement to disclose the mutual relationship of the input and output, and the content of the AI teaching data.

Without such a requirement, we anticipate a flood of applications directed to AI inventions that are no more than a desired outcome, but with no configuration disclosed to achieve the outcome. This would not only increase the burden on Examiners, but also increase the number of patents with unacceptable scope, which could invite confusion in the business community.

Question 7

How can patent applications for AI inventions best comply with the enablement requirement, particularly given the degree of unpredictability of certain AI systems?

Response

Please refer to our response to question 6.

Question 8

Does AI impact the level of a person of ordinary skill in the art? If so, how?

For example: Should assessment of the level of ordinary skill in the art reflect the capability possessed by AI?

Response

As mentioned above, AI could become involved in a variety of inventions from a variety of viewpoints. The level of a person of ordinary skill should be determined based on the technical level at the time that the patent application was filed, in accordance with the respective technological field of each particular AI invention. In other words, the present level of a person of ordinary skill in the art should be applied for AI inventions as well.

However, as mentioned above, inventions achieved solely by AI, without any contribution by a natural person, should not be subject to protection by patent rights. Therefore, there is no need to consider the level of a person of ordinary skill for such inventions.

Question 9

Are there any prior art considerations unique to AI inventions?

Response

We believe that the same prior art standards that are applied to computer-implemented inventions should be applied to AI inventions.

Question 10

Are there any new forms of intellectual property protections that are needed for AI inventions, such as data protection?

Response

Japan's Unfair Competition Prevention Act was revised last year to provide civil remedies, such as claims for injunctions and damages, against unfair acquisition and usage of protected data that is provided to limited users and that is protected by a management system, such as one with IDs and passwords.

Because teaching data for training will become important in AI also, new legal protections, other than patent law, will be needed to protect data whose value depends on the objective of the data.

Japan's Ministry of Economy, Trade and Industry (METI) has provided information on the revisions made to the Unfair Competition Prevention Act, at the following link:

https://www.meti.go.jp/english/policy/economy/chizai/chiteki/pdf/english_2018rev.pdf

Question 11

Are there any other issues pertinent to patenting AI inventions that we should examine?

Response

We request the following with respect to patenting of AI inventions:

1. AI inventions should be examined based on standards similar to those used for computer-implemented inventions. However, as discussed in response to questions 6 and 7, there should also be disclosure and enablement requirements unique for AI inventions. Therefore, we ask that the USPTO create guidelines for examination standards to be followed by Examiners, and to make these guidelines available to patent applicants as well.

2. Modern society with its advancements in networks and cloud computing, also requires protection for AI inventions by worldwide patent rights that extend across country borders. If each country were to consider AI and how to handle it differently, then rights protection could also differ from country to country, possibly resulting in substandard protection in certain regions of the world. Also, dealing with this assortment of rights would place an undue burden on applicants. To avoid this, we hope that the USPTO will work to internationally harmonize how AI inventions should be considered and handled.

Question 12

Are there any relevant policies or practices from other major patent agencies that may help inform USPTO's policies and practices regarding patenting of AI inventions?

Response

We believe that the Japan Patent Office's examination guideline for AI inventions, which includes case samples, will be helpful. We hope that the USPTO will work closely with the Japan Patent Office and patent offices of other countries to harmonize worldwide how AI inventions are considered and handled.