

Comments to Patenting Artificial Intelligence Inventions

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Examination Standards Office,
Administrative Affairs Division,
Japan Patent Office

The Japan Patent Office's Examination Standards Office is pleased to submit our comments in response to the Request for comments on Patenting Artificial Intelligence Inventions. Please refer to the following.

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.

We consider AI inventions include inventions characterized by mathematical or statistical-information-processing technology (hereinafter referred to as "AI core inventions") and inventions characterized by applying AI core inventions to various technologies (hereinafter referred to as "AI-applied inventions").

What we mean by "AI core inventions" are AI information processing methods and algorithms per se, such as machine learning technologies that include neural networks, knowledge based models and fuzzy logic.

According to the IPC, AI core inventions are assigned the code G06N (computer systems based on a specific calculation model). Therefore, we consider the characteristics of the AI information processing methods and algorithms to be elements constituting AI core inventions.

On the other hand, we consider "AI-applied inventions" include two phases: a phase to create a learned model by performing machine learning in order to apply AI to specific fields and uses; and a phase to utilize the learned model for various processing such as estimation/determination/prediction

(including the case where claims are made for a "product" with estimated physical properties).

Therefore, we consider these two phases are the elements constituting AI-applied inventions.

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.

We consider a natural person can contribute to the conception of an AI invention in each phase of developing algorithms, designing learned models, selecting and preprocessing the training data in machine learning and applying created learned models, etc.

Therefore, we consider that a natural person is eligible to be a named inventor of an AI invention, in the same way as inventions in other fields, according to the degree of contribution.

5. Are there any patent eligibility considerations unique to AI inventions?

We don't think there are any patent eligibility considerations unique to AI inventions. The JPO is assuming that suitable protections for AI inventions will also be made possible by using the USPTO's 2019 Revised Patent Subject Matter Eligibility Guidance.

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?

The JPO considers our disclosure requirement to be sufficient enough for a person skilled in the art to perform AI inventions based on the description in Specification. When it comes to deep learning, even without detailed disclosure of trained models and parameters, if a person skilled in the art can perform the claimed AI inventions based on the description in Specification, the disclosure requirement is considered to be satisfied.

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

The JPO responds to this question considering that the AI inventions mentioned here as “AI-applied inventions” that perform estimation processing.

As described above, “AI-applied inventions” use the created learned model for estimation processing.

Therefore, in order for the AI-applied invention to satisfy its enablement requirement, the description that the invention can achieve a certain degree of accuracy in estimation processing should be in Specification, that is, the capacity to create a learned model with a certain degree of accuracy in estimation processing is required for the description in Specification.

An accurate estimation processing is to perform an output related to an input, and an inaccurate estimation processing is to perform an output unrelated to an input.

Therefore, if there is any relationship between input and output data in the training data used to create the learned model, we consider that the AI algorithm is capable of creating a learned model that performs accurate estimation processing based on the above-mentioned input and output data relationship.

That is, if such data relationship is described in the detailed description of the invention, we can determine that there is a description that a learned model having a certain degree of estimation accuracy can be created.

Possible ways of describing such data relationship include statistical proofs and verifying the accuracy of the created learned model through experiments.

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?

If AI is widely used in a technical field, we consider that people skilled in the art in the same technical field can also use AI.

Therefore, the inventive step in that technical field is determined based on the premise that the ability of AI can be used by those skilled in the art.

9. Are there any prior art considerations unique to AI inventions?

Yes, this is because, as mentioned in Question 7, some AI systems may have unpredictability/low predictability, in the case where it is not clear if the AI invention is capable of creating a learned model which has a certain degree of accuracy. The JPO considers such an invention described in the Document cannot be recognized as Cited Invention.

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

We consider that there is room for protecting learning data itself, which is used when creating a learned model as intellectual property other than patents.

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

When a claim is made for a substance (compound, composition, pharmaceutical, etc.) whose physical properties are predicted by AI, it might be helpful if the details on what is required to be patentable (i.e., whether only calculation results are sufficient or chemical experiments are additionally required) are described in Specification.

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?

The JPO has been releasing patent examination cases of AI-related inventions to the public, which clarifies the followings:

- A learned model has the applicability of invention as an invention of program
- When using a general-purpose AI algorithm, its description requirements may be satisfied without detailed disclosure of the learned model and parameters
- Inventive step can be recognized by selection and preprocessing of training data

The JPO has already been disclosing its practices on patenting AI inventions, and for the purpose of reviewing and improving its own practices, the JPO is keen to know the practices at other IP Offices when it comes to patenting AI inventions.