Comments on Patenting Artificial Intelligence Inventions

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Introduction: There are two types of inventions that are being considered as AI inventions: (1) inventions that utilize AI techniques in their structure, and (2) inventions that are developed through the use of AI although the invention can be completely unrelated to AI. Facial recognition methods, which exist on some cell phones, serve as an example of the first group of AI inventions that use AI as a tool to address issues in other fields. Besides an AI algorithm, a facial recognition device would typically include a camera, electronic circuitry, and some additional components so the face recognition device is an invention that utilize some technologies containing AI. On the other hand, there are some inventions that are developed directly through the use of AI. For example, a person may train an AI algorithm by using all the available data for an object (e.g., a hammer) and then the AI algorithm may design a better version of that object (such as a more ergonomic hammer). In either category of invention, AI is a tool that accomplishes a purpose, whereas the owner of the invention is the person who makes use of AI, whether as a part of the invention (like the facial recognition devices) or in the process of creating the invention.

For second category of AI inventions, the inventions that are developed by AI, it could be argued that the inventor cannot be a person who simply runs an AI algorithm, particularly if the inventor possesses little knowledge in the field of the invention; therefore, AI should be considered to be the inventor. The answer to this argument is that for every invention the first step is identifying a gap or need that can be addressed by an invention. Also, in order to train an AI algorithm to have it make an invention, appropriate data is required. Thus, in order to develop an invention through the use of AI there is a need for a person to identify the need, identify the general nature of the solution, provide the dataset, train the algorithm, collect the results, and evaluate the suitability and validity of the results. At the present time, AI techniques have not been developed to the level of being able independently to accomplish the requisite sequence of steps in the invention process. This demonstrates that AI should not be considered to be an inventor or an owner of an invention, but rather AI is merely a tool that can be used for developing an invention.

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.

With reference to the introduction, elements of inventions that utilize AI and elements of inventions that are developed by AI can be different. For inventions that use AI, the invention elements are not all related to AI and depend on the field of the invention, which can any of a wide range of fields from consumer electronics to aerospace. However, the AI algorithm and its application can be necessary elements.

Inventions that are developed through the use of AI are the results of identifying a need, providing an appropriate dataset to train the AI, training AI, and collecting the results, so the invention elements should contain application of the invention and the training details of the algorithm.

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.

This question appears to address the second category of AI inventions. since for the first group of AI inventions the contribution can be evaluated in the same way inventions in other fields. For the inventions developed through the use of AI, the ways that a natural person can contribute to conception of an AI invention and be eligible to be a named inventor is through actions including: selection of the appropriate dataset(s), training an AI algorithm on a dataset, and running the algorithm to obtain the results that can address a problem, and evaluating the results to determine whether they meet a set of criteria qualifying them as a valid, novel, and useful solution to the problem. This view of the issue of invention treats AI in the same manner as any tool, whether simple or sophisticated, that is used in the invention process. For example, an electron microscope may be a necessary tool in the development of a novel material or structure, but there would be no invention without the active involvement of a human who is capable of applying it to the solution of a need or problem.

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?

No, they do not need to be revised, since it is not clear how a non-human entity can contribute to the conception of an invention. As mentioned above, AI as an entity is not able to select a problem or identify an issue independently, which is an initial requirement of an invention, and it cannot independently select or find an appropriate dataset on which to be trained. Moreover, it is not clear how an entity can reduce an invention to practice. At the present, AI cannot do many essentials of an invention independently, so it cannot be the owner of any invention.

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?

The question of whether an AI algorithm, which cannot do many invention essentials independently, should be the owner of an invention must, according to the responses to the previous questions, be answered in the negative: it should not. A person or company that identifies a problem, prepares a training dataset, trains an AI algorithm, collects and evaluates the result, and reduces the invention to practice should be the owner.

5. 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?

For AI inventions, sufficient details about all elements of the invention should be disclosed to enable a person of ordinary skill in the art obtain same output from inputs. Enough disclosure of an invention should be determined based on the claims of the invention. For the invention developed by AI, disclosure of the dataset, the training process, the algorithm, collecting results, and any other details is required.

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

Enablement requirement has direct relation with disclosure of sufficient details of AI invention. A patent application for an AI invention will comply with the enablement requirement if the whole structure of the invention be disclosed in detail.

7. 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?

Yes, it does. For any type of inventions (not only AI inventions) with progress in science and appearance of new tools and methods there will be a need to a person with higher level of ordinary skill in the art. In other words, to examine inventions that are developed by new tools, the examiner should learn how the tools work.

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

Prior art is any evidence that an invention is already known. With considering to above explanation there is not any prior art consideration unique to AI inventions. Since AI is a tool same as other tools which can be used in developing an invention.

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

No, there aren’t. Patent and Copyright will provide enough protection.