From: P. R. Kumar
To: aipartnership
Cc: prk@tamu.edu
Date: Saturday, September 7, 2019 3:52:20 PM

I am a member of the US National Academy of Engineering and work in the field of Artificial Engineering. Here are my responses to the questions posed:

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.

My answer: Mere application of a methodology such as Deep Learning, or Boosting, or Support Vector Machines, regularization, cross-validation, stochastic gradient, etc., should not be considered as an invention worthy of being patented. Each of the above is an algorithm. It should not be patentable simply because it is an application of the relevant algorithm(s) in yet another area. To be worthy, there must be a non-obvious advance in the methodology or algorithm used that is worthy of a patent. Otherwise every single application of existing algorithms will be patentable, which is untenable. This is a bit like saying that every application of dynamic programming can be patented, which is ridiculous.

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.

My answer: To be patentable, it should be a non-obvious advance in the algorithm used. Merely adapting the algorithm to the particular application should not be patentable.

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?

My answer: No. What can be patentable is a non-obvious advance in the algorithm used by a non-natural entity for invention, not the result of the application of that algorithm by a non-natural entity.

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?

My answer: No. Mere training of an algorithm should not be patentable. Such training is merely the running of the algorithm on a certain data, and should not be patentable. Otherwise, it would be like saying that every time one runs a computer program on new data the results should be patentable.

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

My answer: No.

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?

My answer: If the mere running of an algorithm on new data is not patentable, and it should not be, then the issue of recording the weights to which the algorithms has converged should not be patentable.

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

My answer: This question becomes moot when we make it not patentable to just build a system using existing algorithms perhaps with obvious modification only if there is an adncance in the training algorithm.

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?

My answer: No. The level is not important. The algorithm making it possible to develop GENERAL AI systems is patentable IF it has non-advances of previously known algorithms.

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

My answer: No.

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

My answer: We should require public disclosure of ALL information related to patent applications. This is the fundamental agreement between society and inventors: We will give you protection for a certain number of years IF you disclose all information related that invention. We cannot afford to compromise not that golden rule.

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

My answer: No.

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?

My answer: I am not aware of any.