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Request for Comments on Patenting Artificial Intelligence Inventions

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General Comment

I am a software engineer who has worked on machine learning problems. I am not able to contribute to some of the questions, but I am able to comment meaningfully on the following:

2. This question asks about attributing a source or sources for an invention created by an AI (however that may be defined as determined by question 1). Speaking from experience, applying machine learning to a problem is not hard. Applying it successfully is the challenge.

It is easy to give a computer some raw dataset and attempt to make it learn. But this is not an effective approach. An analogy for the machine learning process is how a child may learn in an elementary school class. It is easy to try to teach the child a skill by forcing them to read several books on the skill. But it is not effective. The process of teaching a child is just that - a process. It must be done carefully, choosing what order to teach the information, how to present the information, and the teaching must be adapted to how the child learns. Sometimes, a lecture is best; other times, a child will learn better by reading; and other times, the best way to learn will be hands-on practice with models and diagrams. A machine learning program is very similar. The data given to the learning process must be carefully adjusted and tuned, a process called "cleaning" the data. Then, through a long process of trial and error, you tune the learning algorithm until it works. Finally, you must test the algorithm, and be careful to check for shortcuts and pitfalls that the machine may have learned.

The credit for the success of the machine learning process should de facto fall to the programmers or analysts who taught the machine. The process of teaching the machine is long, difficult, creative, and where most innovations lie. Addressing the original question, then, the legal source, or attribution, for the invention should be the team of programmers and analysts who taught the machine.

These arguments only apply to the case of a machine learning algorithm, i.e. to an algorithm that is able to perform a skill that the creators of the algorithm were unable to encode themselves. These arguments do not apply to the case of an AI or algorithm that was created using the applied knowledge and skills of its creators on the task it is performing, i.e. to an algorithm that was not "taught" a skill, but instead was directly created with the ability to perform the skill inherently. For example, in a self-driving car AI, these arguments could apply to

the image / object recognition, but would not apply to the encoded rules for driving (like "you may turn right on a red light after stopping").

3. This question asks about the possible need to credit an AI in a patent filing as contributing to the invention. For this case, I suggest considering the scenario where one team creates an AI that then solves a problem in multiple ways, each of which is then patented. For a contrived instance of this scenario, suppose an AI is created that has been taught to design a click pen. That AI then yields 3 or 4 different mechanical ways to implement a click pen, and each is patented individually. Should the team claim inventorship for each? Such a situation can lead to one person or one small team claiming inventorship on hundreds, possibly thousands of patents. I'm unsure of the legal ramifications for this, but from a layman's point of view, it does not seem to be something the patent system is equipped to handle. We have had industrious inventors in the past, but the scale that AI inventorship could reach is much, much higher than any human can create in their lifetime. The solution to the AI inventorship issue should include a way to address many inventions by one AI; or, the patent system must be prepared for the possibility of a flood of patents.