Thank you for allowing me this opportunity to respond on the topic of RFC on Patenting Artificial Intelligence Inventions, Docket No PTO-C-2019-0029. I am an AI developer and researcher, and the following comments are on my own behalf, not representing any company or organization.

The field of AI is filled with innovation and changes quickly, but currently it is also surrounded by a great deal of hype and a great deal of investor excitement. This fuels interest in various changes to the criteria of patent protection, as outlined in this RFC. However, these need to be cautiously balanced to ensure the quality and reliability of resulting IP protection.

In this commenter's opinion, AI patent protection should continue to be construed following the existing cautious guidelines, and resist being modified too hastily. We should also be skeptical about the popular media's tendency to anthropomorphize mechanical AI processes as creative or inventive. The answers to the specific RFC questions, included below, will address these points in more detail.

Yours sincerely,

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Specific questions from the RFC:

Question: 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. It is severely problematic to consider AI processes and entities other than natural persons as contributing to the conception of an invention.

It has long been the policy of the USPTO that corporations and other abstract entities are not inventors, and this policy is sound and should be retained: for example, corporations, being legal abstractions, clearly cannot conceive of inventions. However, AI technology prompts some to question what happens if an AI process produces an invention: should it (or its owner) be named the inventor?

The test is one of agency: who or what has the creativity and intentionality required to be able to conceive of an invention? I would respectfully argue that only the human creator does. AI processes can generate many variants of plans or policies, and test them at high speeds, but only the human understands the goals and constraints of the work, why are they structured as they are, how to evaluate them in context, and so on. Only the human has the intentionality and judgment required to *conceive* of something as an invention. In contrast, an AI process may *represent* some goals and constraints internally (for example, as mathematical utility functions or policy constraints), but it merely follows those goals and constraints without understanding, and without human intentionality. It does not intend and understand them in any reasonable sense of the words.

In the end, the idea that an AI process could conceive or invent anything is just fanciful anthropomorphism. AI processes are material tools with which inventions can be developed, iterated on, and tested; they may operate virtually, and at extraordinary speeds, but they are still material tools, just like simulation software on a desktop computer. It would be unreasonable to say that CAD (computer-aided design) software, which performs millions of calculations per second to simulate, for example, how different shapes of airplane wings might behave in wind tunnels, is an inventor, or somehow contributes to the conception of an invention. AI software that performs calculations and generates results does not contribute to the conception of an invention any more than CAD software does.

Question: 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?

Only natural persons should be considered inventors, and the existing policy does not require changes.

Unambiguously, all AI processes lack the agency required for their work to count as conceiving of an invention; this creativity rests entirely in the humans who devised these machines. A company, similarly, as a legal abstraction obviously lacks the agency and creativity to conceive the invention. The people who work at the company can be inventors, but it would be nonsensical for an abstraction or a machine to be considered an inventor.

To reiterate the previous example: a desktop software that simulates millions of outcomes and produces a result that humans deem novel and interesting is not an inventor, even if it is programmed to modify its work based on various input types or goals, and to try various permutations. Similarly, the legal entity that funded the creation of this software did not conceive of this invention, and is not an inventor. Clearly, only the humans who conceived of this system can be the inventors here.

Question. 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?

Yes, there needs to be a correction to the level of detail in the disclosure, to ensure much more detail is presented. Removing or easing the disclosure requirement would carry severely negative consequences, preventing others skilled in the art from understanding the invention.

Specifically: if the claimed invention uses algorithms with specific policies/weights/etc. that affect how it functions, then those policies/weights are necessary components of the invention, and they are necessary to explain the behavior of the system to a person skilled in the art. As necessary components of the invention, they must be disclosed. Not disclosing *all* of these elements (not just algorithms and design, but also policies) in a readable and reproducible way will clearly prevent a person skilled in the art from understanding the invention.

Per the current USPTO policy, the disclosure of algorithms or processes does not have to be in source code or flowcharts, it can be described as a detailed process or in other ways. But for AI applications specifically, if policies/weights are an integral part of the invention, it should be a requirement to disclose those as well, as part of the claim, regardless of their size or representational difficulty. And while there is currently no industry standard for representing policies/weights across different families of AI algorithms, this should not stop the Office from requiring those disclosures from being presented in some other way that is both human- and machine-readable and suitable for archiving.