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Should We Require Human Inventorship? Submit Your Amicus Brief by March

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A variety of artificial intelligence (AI) technologies exist and are being used in biopharma (e.g., discovery and development of drugs, optimization of clinical trial design, identification of novel biological targets and pathways of interest, analysis and use of biomedical, clinical, and patient data, and many others). As in most industries, AI will play an increasingly larger role in biopharma patents. However, there are a number of challenges of AI in biopharma patents. One of these challenges that has recently come to the forefront is the question of inventorship.

Patent systems around the globe offer a quid pro quo that exchanges limited monopolies for disclosures of inventions. Most patent filings list: (1) the inventor(s); and (2) the applicant. The applicant may be an assignee (e.g., company, university, organization, etc.) with rights to seek patent protection on innovations identified during employment and within the scope of employment. Frequently, the assignee is a current or former employer of the inventor(s).

In some jurisdictions (e.g., in the United States), the inventor(s) hold the rights to prosecute the patent application and assert any resulting patent unless and until the inventor(s) assign those rights to another entity (which is frequently done in employment and work for hire contracts). In some jurisdictions (e.g., the European Union), it is presumed that the party that applied for a patent holds the rights to the patent application.

Thus, it is well-established that non-human entities may be the applicant, assignee, and/or owner of a patent. However, it is **not** well-established that a non-human entity may be an inventor on a patent application. Multiple patent offices (e.g., [USPTO](#), [UKIPO](#), and [WIPO](#)) have been considering what the standard in this respect should be.

The DABUS Examples

Recently, this issue has been pressed by Dr. Stephen Thaler, who applied for multiple patents without listing any human inventors in the application. The assertion was that an artificial intelligence algorithm, named Device for the Autonomous Bootstrapping of Unified Sentience (DABUS), identified each of two inventions. DABUS includes multiple neural networks (each trained in a given linguistic subspace) that are dynamically connected using controlled chaos. Further, DABUS includes a novelty filter to predict which chains of neural networks represent novel sentiments and a foveator neural network to predict which chains represent sentiments having

a target utility. One of the patent applications was for a food container with walls having fractal profiles (which may prevent stacked containers from sticking to each other). Another of the patent applications was for a warning light that flashed with a temporal sequence (having a particular fractal dimension) predicted to be particularly effective in grabbing attention of a person.

Multiple patent offices have asserted the DABUS patent applications did not comply with patent requirements due to the absence of a listing of a human inventor. In the United States, the [USPTO rejected](#) U.S. Patent Application Numbers 16/524,350 and 16/524,532, contending artificial intelligence (AI) systems cannot be listed or credited as inventors on a U.S. patent. One of these [decisions](#) was published and states an “inventor” under current patent law can only be a “natural person.” The USPTO explained that the relevant statutory provisions governing patents consistently refer to inventors as natural persons and interpreting the term “inventor” to include machines “would contradict the plain reading of the patent statutes that refer to persons and individuals.” The USPTO also referred to several Federal Circuit precedents to support the conclusion that an inventor must be a natural person. With reference to [Univ. of Utah v. Max-Planck-Gesellschaft zur Forderung der Wissenschaften e. V.](#), the USPTO explained that the Federal Circuit has ruled a state could not be an inventor because inventors are individuals who conceive of an invention and conception is a “formation of the mind of the inventor” and “a mental act.” The USPTO reasoned “conception—the touchstone of inventorship—must be performed by a natural person.” The Applicant has appealed these rejections to the Eastern District of Virginia (E.D. Va.).

This ruling by the USPTO followed similar stances adopted by the European Patent Office (EPO) and the UK Intellectual Property Office (UKIPO), each of which rejected patent application(s) that designated DABUS as the inventor. Under the European Patent Convention (EPC), the rules require the patent application to designate the inventor in terms of their family name, given names and full address. In its DABUS [decisions](#), the EPO considered that the interpretation of the rules of the EPC led to the conclusion that the inventor designated in a European patent had to be a “natural person.” The EPO explained that inventorship conferred various legal rights, but that to exercise them “the inventor must have a legal personality that AI systems or machines do not enjoy.” The Applicant has appealed these rejections to the Board of Appeals at the EPO.

In the UK, patent law rules around inventorship are expressed somewhat similar to the U.S. The inventor is said to be the “actual deviser” of the invention. According to case law, there are two requirements underlying this concept. First, they must be a natural person. Second, they must have contributed to the inventive concept. The [UKIPO's DABUS decision](#) centered on the first requirement and came to similar conclusions to the EPO. Referring to the rule and legislative framework underlying the EPC, the UKIPO agreed that a natural person had to refer to a human. The decision of the UKIPO was reviewed in the England and Wales High Court (Patent Court) by Mr. Justice Marcus Smith, who held that the grounds of appeal fail and Dr. Stephen Thaler's appeal must be dismissed.

Consequences and Questions

What is the potential consequence of these cases? Consider again the fact that many intellectual property systems are requesting input as to whether/how to respond to situations where artificial intelligence may contribute (in a manner that may have traditionally been considered to be “to the conception of”) an invention. Should entities be allowed to list the AI algorithm as an inventor? Should entities be required to list the AI algorithm as an inventor? Should the requirement of listing inventors be abolished entirely?

The DABUS cases have the potential to reshape the ownership of patents across the world.

If initial ownership is granted to algorithms: how will society adapt (potentially through contracts) with increasingly powerful software developed by one entity and licensed or sold to another entity? How will we distinguish between a human’s conception of an invention and a machine’s contribution that displaces part or all of such conception? How will we respond to computer code that is dynamically changing in response to edits from many programmers and has capabilities that evolve due to an ever-changing big-data set?

However, if the “inventive” contribution of algorithms is not recognized: might we have some entities claiming undue credit for inventions? May some entities choose not to develop or commercialize an innovation due to a lack of the possibility for market exclusivity? Would the development of more powerful artificial intelligence algorithms or applications be thwarted due to reduced market potential?

Have Your Say

The hearing date for the U.S. DABUS case is set for March 29, 2021. Thus, it is reasonably likely that amicus briefs submitted by mid-March will be considered. In Europe, the EPO has until May 1, 2021 to submit comments. Thus, it is reasonably likely that third party observations submitted before that date will be considered.

If an uninvolved third party has opinions as to whether a patent office should prohibit, permit, or require an artificial intelligence algorithm to be listed as an inventor, the opportunity for submitting thoughts (e.g., via an Amicus Brief or Third Party Observation) is now. While it is true that such opportunities may arise again as these decisions are appealed (which the authors predict they will be), outlining the discussion points at this stage may be particularly advantageous. The amicus may have the opportunity to shape the discourse, be one of few perpetual “friends of the court,” and make an impact on the outcome of cases of significance and on the development of patent law.

We recommend that parties who regularly use or develop AI in their innovation pipelines consider this opportunity. The authors acknowledge that there is a wide spectrum in terms of the degree to which AI may be involved in an invention pipeline. In some instances, a first party may identify a problem and a target type of solution and use an AI algorithm (coded by the first party or by another party) to generate a solution of the

target type for the problem. As AI advances, it is conceivable a problem identified by a human may become of a higher level of generality; an AI algorithm may itself identify more specific problems to address the general goal; and/or an AI algorithm may itself be able to detect when a solution is sufficiently new and useful to justify potential patent pursuits. The DABUS cases have the potential to influence whether and/or how any party would be allowed to pursue patents in these latter instances. Thus, the authors submit that it may be particularly important and helpful for the courts to receive input from “friends” (via an amicus brief or Third Party Observation) that dives into the current power of artificial intelligence algorithms, the potential capabilities of artificial intelligence algorithms, and/or how various inventorship requirements (that may prohibit, permit, or require listing an AI algorithm in defined circumstances) have the potential to influence innovation.