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The Robot's Invention: Patent Considerations In AI

By **Eric Sopher, Tanguy de Carbonnieres and Kamyar Maserrat** (July 9, 2018, 1:28 PM EDT)

Until the world is overtaken by robots in a nightmare scenario of the type predicted by Elon Musk and Stephen Hawking, the intellectual property community is contemplating how to protect innovations developed using artificial intelligence. AI raises the capabilities of computers beyond just crunching massive amounts of data to also include the use of machine learning to adapt an algorithm as new data is ingested. AI-enabled solutions continue to disrupt existing technological frameworks, and also raise new issues beyond those conventional frameworks.



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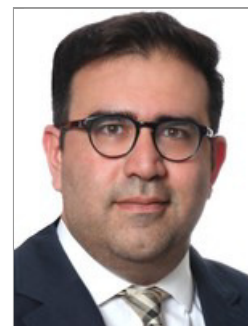
Patent Eligibility Challenges

Even though the U.S. Supreme Court has never stated that software is patent-ineligible, its ruling in *Alice v. CLS Bank*[1] has shifted the standard for software patent eligibility. Since *Alice*, several decisions by the U.S. Court of Appeals for the Federal Circuit provide guidance to patent practitioners regarding which types of innovative concepts may be deemed patent-eligible. However, the guidance has yet to provide a bright-line rule regarding patent eligibility of AI-based innovations. U.S. Patent and Trademark Office examiners continue to offer variations on their interpretations of the eligibility hurdle for AI-enabled computer innovations.



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Claims should explore the innovative AI-implementation, though it is not yet clear what level of detail is required to establish eligibility. The USPTO evaluates patent eligibility of claims that merely mention implementation by a machine-learning algorithm as well as claims that more specifically describe iterative processes for training the algorithm. Yet the ultimate eligibility determination varies by art unit and assigned examiner, with some examiners challenging the eligibility of claims if they appear to have been implemented using well-understood, routine and conventional computers.



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AI-enabled software programs use specialized algorithms that may be trained by a first set of data and generate better results as the software learns from an input of additional data. An applicant should consider the extent of both the training and learning that may be necessary to overcome any patent-eligibility challenges. As these AI-enabled software programs are increasingly utilized in a data processing environment, the USPTO may be more likely to recognize those computer-

specific features more closely tied to hardware or tangible components. Further, it may be worthwhile pursuing claims directed to training a machine-learning algorithm and not just the application of the algorithm to a set of data to achieve a particular output.

In addition to the other requirements for patentability, applicants may want to consider how much detail is necessary to describe the AI-based innovation and how to show that the AI-specific framework is integral to the inventive concept. Likewise, applicants describing the innovation so broadly may need to ensure that the claimed invention cannot be performed by noncomputer means, such as manually, by a human. As a result, striking the correct balance of detail and breadth, a matter of long-standing concern of applicants, should continue to be a consideration.

Detecting Infringement

Asserting infringement can be either a way of excluding others from practicing the claimed invention or a route to monetizing your AI-based IP. However, because so many of these models are not open source and their inner-workings are not made available to the public, a patent owner may find it challenging to detect infringement. Even those vendors that provide AI models as a service may not provide details about how the models are generated and trained. As a result, applicants should consider seeking claim scope that is aligned with publicly available information.

Machine as Inventor

While protecting innovations for a new AI-enabled machine involves applying current precedent to nascent and evolving technology, protecting innovations generated by the AI-enabled machine raises an entirely new issue. As recently as three decades ago, the thought of a computer conceiving an invention seemed like science fiction. Today, it is foreseeable and almost expected that a computer will soon conceive patentable ideas. Under current U.S. law, an invention conceived by a machine may be ineligible for patent protection because the Patent Act defines an "inventor" as an "individual" or "individuals."^[2] While a human inventor was likely involved in creating the smart machine, the process of determining contributions to conception of patentable ideas can become impossible an AI algorithm, albeit one created by a team of engineers, continues to learn from new inputs of data. Individuals may not have even identified the problem being solved, and the AI algorithm may have found a solution that was not readily apparent to any human involved in the programming.

The U.K.'s copyright laws address this type of situation. In the U.K., "in the case of a literary, dramatic, musical or artistic work which is computer-generated, the author of a computer-generated work shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken."^[3] U.K. law defines a computer-generated work as one that is generated by computer "in circumstances such that there is no human author of the work."^[4] These strict requirements are directed towards software solutions where a digital creative spark was nonexistent and virtually impossible to detect. Our legal framework may need to adapt to these recent technological advancements. Identifying "the person by whom the arrangements necessary for the creation of the work are undertaken" is more complicated for AI-software programs than conventional software programs.

Ownership of AI Innovations

An inventor who conceives of an invention may be obligated to assign those rights — but when inventorship is more difficult to assess, determining ownership becomes murkier. While typical innovations allow practitioners to identify inventorship with a relative degree of certainty, the nature of AI computer modeling creates new challenges. For instance, machine learning will start with an algorithm, and the algorithm will adapt the model using

data sets, rather than requiring additional coding by a human. Machine-learning techniques allow a user to input data for which all attributes and hierarchical relevancies are known to the user, then the model may reconfigure itself based on the known data, a process generally known as "training the model." After the training period, the model may, based on the learned knowledge, perform various calculations on unknown data.

Identifying inventorship for AI-enabled technology is especially challenging because the party generating the initial model, the party training the model and the party providing the known data to train the model may not be one and the same. Indeed, these parties may even have competing interests. Consider a scenario in which Company A employs Company B to provide AI-related services. Typically, Company B may have developed an initial AI model. However, to be properly utilized and customized to suit the needs of Company A, the AI model must be trained by existing and known data, such as customer datasets stored onto Company A's databases, data owned by Company A, or even data Company A obtained from another Company C.

As a result, the AI model owned and developed by Company B gains knowledge via data sets owned and developed by Company A and by Company C. Therefore, even though Company A may not have directly contributed to the AI model's initial algorithm, it has played a vital role in the model's development. This may entitle Company A to some IP rights. For example, when only providing raw data for the purposes of training the AI model, Company A may not have any inventorship rights. However, if Company A participated in a supervised training of the AI model from Companies B and C, then Company A may have directly contributed to the model and may be entitled to an inventorship or ownership claim. Current law does not provide clear guidance as to whether Company A must be listed as an inventor to a patent application claiming the AI model or whether it may be considered an owner of the AI model.

The above scenario also raises a few other interesting legal conundrums, such as whether Company A can (1) prevent the AI model from being used by its competitors or (2) prevent future iterations of the AI model from using the learnings derived from Company A's data. Also remaining unclear are the implications of training an AI model utilizing another company's trade secret or other intellectual property.

Conclusion

As usual, patent law is not evolving as quickly as technology, and we will just have to wait and see how the USPTO and the courts consider the implications of patentability, inventorship and ownership of extant and future AI-enabled innovations. Perhaps an AI solution will provide some clarity on these issues!

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[1] Alice Corp. v. CLS Bank Intl., 573 U.S. ___, 134 S. Ct. 2347 (2014).

[2] 35 U.S.C. §100(f)

[3] Copyright, Designs and Patents Act (CDPA), Section 9(3)

[4] CDPA, Section 178

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