



November 8, 2019

The Honorable Andrei Iancu
Under Secretary of Commerce for Intellectual Property
Director of the United States Patent and Trademark Office
600 Dulany Street
Alexandria, VA 22314

Via email: AIPartnership@USPTO.gov

AUTM Comments on Patenting Artificial Intelligence Inventions (Docket No. PTO-C-2019-0029)

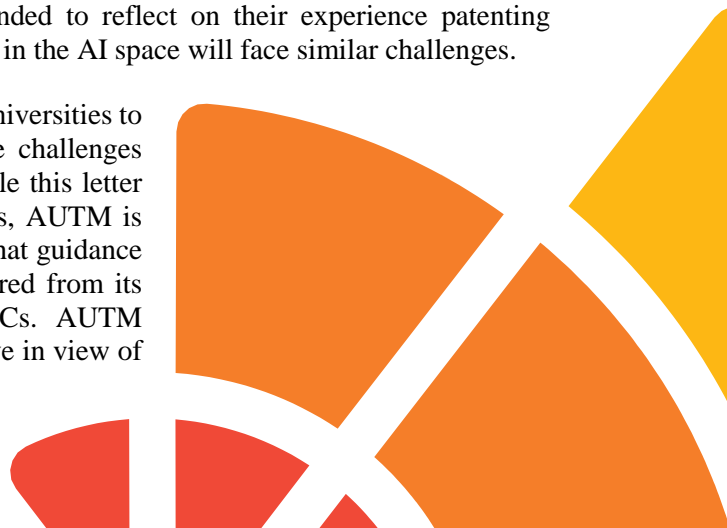
Dear Under Secretary Iancu:

Thank you for the opportunity to provide comments regarding patenting artificial intelligence inventions posted in the Federal Register on August 27, 2019.

Using the 12 questions posed by the USPTO as a guide, an AUTM task force gathered feedback from a broad array of its constituents. The task force had independent conversations with technology transfer offices at universities across the United States, as well as with several private practice patent attorneys handling prosecution of numerous universities' AI invention portfolios. In addition, a venture capitalist with experience investing in AI-based startups and academic researchers who have been inventors in this technology space were consulted.

Unsurprisingly, it was challenging to establish consensus and formulate specific, detailed responses to the questions given the technology disciplines from which universities receive AI-enabled invention disclosures vary greatly. For example, universities having affiliated hospital systems were more likely to raise questions around their future success in patenting in the AI space in view of data privacy concerns. Institutions with robust computer science disciplines, on the other hand, tended to reflect on their experience patenting software-related inventions and questioned whether patenting in the AI space will face similar challenges.

Yet it is this diversity of perspective that uniquely positions universities to provide invaluable comprehensive insight into some of the challenges owners of AI-enabled inventions are facing. Therefore, while this letter does not directly respond to each of the USPTO's questions, AUTM is providing this information to confirm the USPTO's instinct that guidance is, in fact, needed and to share some of the feedback gathered from its university constituents, as well as attorneys, inventors and VCs. AUTM would welcome any follow up questions the USPTO may have in view of the information provided below.



QUESTIONS POSED

In addition to seeking responses to the USPTO's 12 questions, the AUTM task force sought the following information from those it spoke with:

- (1) *Are you experiencing an uptick in the volume of newly disclosed AI-enabled inventions?*
- (2) *What challenges are you experiencing in determining whether to pursue patenting of such AI-enabled inventions? Has uncertainty concerning the patentability and enforceability of AI-inventions impacted your process in determining whether, and if so how, to pursue patenting? Has it impacted your ability to attract potential licensees?*
- (3) *How are you handling management of the data? How significant is data access and management to commercialization of the AI invention?*
- (4) *With respect to what aspects would you benefit from further guidance from the USPTO with respect to patenting AI inventions?*
- (5) *What feedback can we pass along to the USPTO to assist it in the development of such guidance?*

DISCUSSION

I. Academic institutions are experiencing a sharp increase in the volume and complexity of AI-enabled invention disclosures and would welcome USPTO guidelines to assist them in deciphering whether to, and how to most effectively, pursue patenting of such inventions.¹

The most cohesive feedback received from academic technology transfer offices, their outside patent counsel, and venture capitalists is that the volume of AI-enabled technologies arising from academic labs is rapidly increasing and expanding to new technical fields. They also universally anticipate this trend will endure as the applications of AI will continue to grow and diversify as (1) the quantity, quality and variety of data available to train algorithm increases, (2) computing power strengthens, and (3) the bar for accessing these data and computer assets lowers. Several of the academic institutions we spoke with are bolstering their investments in, and the resources available to support, this technology space. Given these efforts, there is a general desire among academic technology transfer offices and their outside counsel to be well positioned to ensure the resulting innovations and technologies are translated from their labs to the marketplace to benefit the public, generate income to support further research and education, and increase their global impact.

As universities are beginning to struggle with the volume, and how to assess the patentability, of their AI-enabled invention disclosures, everyone we spoke with was pleased to hear the USPTO is considering investing time and resources to bolster its review processes and draft guidelines for applicants. Patents are an important asset in this technology sector for attracting the investment necessary to translate nascent inventions to commercial products. Guidance is very much welcomed as the academic technology transfer offices noted they often forego patenting AI-enabled inventions simply because it is too unpredictable in this technology sector whether they will be successful in obtaining patents (and patents that have sufficient perceived value to potential licensees) to justify the time and expenses involved.

Not surprisingly, the type of AI-enabled inventions and specific patentability concerns among the institutions varied to a degree based on each institution's ecosystem. For example, institutions having affiliated hospitals

¹ Comments under this heading are responsive to the USPTO's questions 6, 7, 10, and 11, as well as more generally to its request for comments.

often focused their comments around issues posed by patenting and licensing healthcare-related AI inventions (e.g., diagnostic tools). As a result, the conversations tended to revolve around the challenges involved with the use and management of patient data. How will the written description and enablement requirements be met when the underlying datasets that trained the algorithm contain sensitive information, e.g., healthcare records? These technology transfer offices predict it may be challenging and time consuming to obtain certainty around whether and to what extent such information can be used to support the pursuit of a patent and subsequent commercialization.

Many academic technology transfer offices also predict that ensuring exclusivity may be crucial in the AI health-tech space to attract licensees and investors, particularly if regulatory processes are involved (e.g., FDA, 510(K), CLIA). Similar to pharmaceuticals and medical devices, commercialization of AI-supported healthcare tools are likely to have long development paths which will need to be adequately protected to justify the necessary investment and risk involved. Therefore, the perceived value of issued patents in this technology space may play a crucial role in the ability for the technology to reach the commercial marketplace.

In comparison, conversations concerning AI-enabled technologies outside of the healthcare space tended to focus on the novelty of the algorithm and whether an issued patent's claim scope and enforceability will justify the investment required to obtain it. A few of the university constituents and outside counsel AUTM spoke with contemplated whether patents warrant the time and resources required given the speed at which AI-enabled technologies evolve and the current patentability trends in the software space (though everyone we spoke with greatly appreciated the USPTO's most recent guidance). And perhaps due to these factors, other assets (e.g., startup's ability to access data to further train and strengthen its AI tool, its strategy for diversifying its business, and its management team) would become more important differentiators.

In view of the budgetary and staffing constraints placed on academic institutions' ability to pursue patents on technologies arising from their campuses, any guidance the USPTO is willing to provide that will bring more certainty to patenting decisions will be very much appreciated. University technology transfer offices may choose to adopt an overly broad practice of foregoing patenting of AI-enabled inventions if it proves to be too vague, nuanced, expensive, or time consuming of a process to satisfy the patenting requirements. Clear examples as to what the USPTO will deem to constitute sufficient versus inadequate disclosure, as applied to a broad spectrum of AI-enabled inventions, will improve the transparency of the patenting process and increase the chances university technology transfer offices will remain engaged in patenting in this technology sector. Such guidance will also help universities conserve and more strategically use the limited resources they have to pursue patenting of the large volume inventions arising from their campuses.

II. While academic institutions' opinions varied as to how crucial patent rights will be to the success of commercializing AI-enabled inventions, they nearly all agreed the current patent examination framework (with specific guidance) is workable as applied to AI-enabled inventions, at least for now.²

Although the academic institutions and patent counsel AUTM spoke with ultimately concluded the current patent system is probably adequate, AUTM would like to share a couple of the ideas that were floated when vetting whether new forms of intellectual property protections are needed for AI inventions:

- **Consider Utility Model Protection:** For AI-enabled inventions, and perhaps more broadly for other inventions (e.g., computer-implemented inventions such as software), perhaps the USPTO should adopt a system similar to utility model protection that is currently available in a small but significant number of countries (Japan, China, several EU countries, etc.). This model could allow for a quicker, cheaper examination with less stringent requirements (e.g., obviousness, written description and enablement) in exchange for a shorter-term exclusivity (e.g., 6-10 years). And perhaps as utility

² Comments under this heading are responsive to the USPTO's questions 5, 6, 7, 10, and 11, as well as more generally to its request for comments.

patent applications are found to have issues meeting 112 and 103 requirements, applicants would have the ability to convert their utility patent applications to utility model applications and thereby still obtain some rights in exchange for their disclosure.

- **Bolster copyright protection for training datasets:** In many cases, data access will drive the commercial success of an AI-enabled technology and disclosure of the datasets that trained the invention may be important for supporting enablement during the patenting process. It is widely acknowledged that the datasets, while they may not always contribute novelty to the invention, can be highly valuable. And the effort required to obtain access to, collect, annotate, and refine the datasets can be onerous and have aspects of creativity and novelty. If this effort is adequately rewarded, creators of these datasets will be incentivized to contribute their ideas to further the progress of AI-related science and technology.

After acknowledging the above ideas may be difficult to implement and may not be entirely necessary in the short term, we next brainstormed what issues need to be addressed and whether AI inventions could borrow from frameworks developed around other types of inventions that present analogous issues. Academic institutions agreed establishing confidence around the validity and enforceability of patents pursued on AI-enabled inventions will influence their success in attracting partners to license and commercialize these technologies. A few ideas that were repeatedly raised include:

- **Establish a repository for training datasets to be filed and protected.** Perhaps applicants should be permitted or required to supplement their disclosures with training datasets similar to the nucleotide sequence disclosures made pursuant to 37 C.F.R. 1.821(c) (“Patent applications which contain disclosures of nucleotide and/or amino acid sequences must contain, as a separate part of the disclosure, a paper or compact disc copy (*see* § 1.52(e)) disclosing the nucleotide and/or amino acid sequence.”). And perhaps the scope of the claims would consider the breadth and volume of the training datasets, as well as manner in which such data is culled. The USPTO may want to consider what amount of disclosure will be required to get an AI invention through the FDA, if such regulatory approval is required, e.g., diagnostic tool. Unless FDA applicants have strong assurances that their invention and data will be protected, investment in this technology space may be negatively impacted.
- **Confirm patents continue to be available computer-implemented inventions:** To continue “[t]o promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries,” it is important to retain the possibility for an applicant to obtain a reasonable scope of patent protection, agnostic with respect to technical field, provided that the claimed invention is found to comply with current statutory requirements. If machine-implemented inventions start to become perceived as being off the table because of their subject matter, then inventors may decide to forego disclosure and instead maintain their discoveries as trade secrets. However, wide publication of results is a fundamental tenet of university culture. Therefore, overreliance on trade secrets as an effective means to protect computer-implemented inventions may have unintended detrimental effects on the volume and breadth of university-industry collaborations and will narrow the means by which academic institutions can effectively commercialize their researchers’ technologies. It was further noted that while terms such as “useful,” “novel,” “not obvious to someone of ordinary skill in the art,” “enabled,” and “described” change along with and on the same time scale as scientific and technical innovation, judicial exceptions do not.
- **Permissibility of functional claiming for computer-implemented inventions:** Applicants of AI-enabled inventions may face difficulty adequately describing all potential outputs and applications of their inventions and all the possible methods by which they can be implemented. This is due in part to potential broad applicability and the variety of ways computers can be programmed. Functional claiming may be an attractive means for describing an AI-enabled invention because it may be more practical to describe the invention by what it does as opposed to what it is. There is some concern among those AUTM spoke with that recent case law will deter applicants from electing to disclose

their computer-implemented inventions in view of the potential concern of prejudicial treatment during examination and/or that the patent will be subsequently determined to be invalid for indefiniteness, overly broad claim scope, undesired “means-plus-function” interpretation, etc. To the extent functional claiming is permitted in other art units, it should similarly be permitted for machine learning and computer-implemented inventions.

AUTM acknowledges patents are not the sole means by which university technologies can be transferred to benefit society at large and was pleased to see the USPTO recently issued a second AI-related Federal Register Notice regarding other forms of IP. It is likely AUTM will respond to the USPTO’s second set of questions as well given copyrights, trademarks, database protections, and trade secrets are also useful in commercializing AI-enabled technologies. That said, while these other forms of IP protection are relied on by university technology transfer offices, patents remain – by far – the most commonly used (and arguably most effective) tool to facilitate the out-licensing and commercialization of inventions arising from academic research.

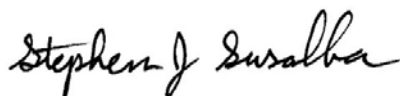
III. Academic Institutions and their counsel concluded that, above all else, effectively protecting and managing use and disclosure of proprietary data will play a central role as to whether and to what extent academic institutions pursue patents on AI-enabled technologies.³

While the academic institutions AUTM spoke with were highly interested in the USPTO’s efforts in providing clarity around patenting AI-enabled inventions, the conversations inevitably veered to the importance of properly managing the use, disclosure and licensing of data. Universities are continually generating vast amounts of data. Institutions with affiliated hospitals in particular are natural repositories of healthcare records that could be used to create datasets to train algorithms. And these trained algorithms may be translated into tools that in turn improve the quality and efficiency of patientcare.

However, recent news headlines regarding mistakenly disclosed patient healthcare records and potential conflicts of interest involving data license transactions have tempered some of the excitement over the power of AI-enabled technologies. Academic technology transfer offices are cognizant of these issues both from an out-licensing, as well as an invention intake, perspective. Discerning whether and to what extent datasets can be used and disclosed can be difficult and require time and resources. Academic technology transfer offices would greatly appreciate if the USPTO would consider these challenges when drafting section 112 guidelines.

Above all else, the USPTO’s efforts to provide guidance would be greatly appreciated. The academic institutions AUTM spoke with are just beginning to file patent applications in this space and have not yet faced substantial prosecution. They were all very pleased to hear the USPTO is interested in providing guidance and acknowledge it will not be an easy task. As fields of technical endeavor are literally invented with the passage of time, we strongly support recruiting patent examiners from these emerging fields and continuing to train examiners in the most cutting edge science and technology. We strongly support the USPTO and commend the important work its staff carries out on behalf of innovators everywhere.

Sincerely,



Stephen J. Susalka, PhD, CLP, RTTP

AUTM CEO

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