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Keys To Successful AI Patents in the U.S. And Europe

On Jan. 31, 2019, the [World Intellectual Property Organization](#), released its first publication in a series of “Technology Trends” studies.[1] This study concerned inventions based on artificial intelligence. Unsurprisingly, WIPO found that patent filings for AI inventions are increasing rapidly.

The study noted that half of all AI patent filings were filed since 2013,[2] and that AI patent filings for machine learning, deep learning and robotics have had average annual growth rates of 28 percent, 175 percent, and 55 percent, respectively, compared with 10 percent for all technologies.[3] Perhaps also unsurprisingly, 26 of the top 30 applicants related to AI patent filings were companies (the remaining being universities or public research organizations).[4]

Finally, likely indicating a fundamental shift away from research-based development of AI to a more commercial development of AI, the ratio of scientific literature/publications on AI fell from eight papers per AI patent filing in 2010 to three papers per AI patent filing in 2015, even when counting only a single patent filing per patent family.[5]

While the quantity of filings is increasing, stakeholders should be mindful of maintaining the quality of their AI patent filings. As a historical analogy, in the late 1990s: (1) State Street Bank[6] confirmed that business methods were patentable in the U.S.; (2) the majority of U.S. households had internet access for the first time; and (3) the dotcom bubble was in full swing. This legal and technological atmosphere led to an explosion in the number of software patents, and unfortunately the granting of many software patents of questionable quality (i.e., patents covering a known practice “plus the internet”).

Since that time, both the United States Patent and Trademark Office and European Patent Office have adjusted their practices, and both have safeguards in place to deal with question patents (e.g., U.S. post-grant proceedings and EPO oppositions). These adjustments and safeguards have resulted in an unprecedented number of patents being revoked and created new prosecution roadblocks for pending applications.

While most would agree that striking questionable patents creates a net benefit to the system, it is hard not to be sympathetic to inventors with true innovations that were revoked due to poorly drafted applications. Therefore, in the rush to protect their AI innovations, stakeholders should be mindful to ensure that their AI patent filings cover patent-eligible subject matter and are nonobvious.

Ensuring Patent-Eligible Subject Matter

To address the surge in AI patent filings, the [USPTO](#) and EPO have both made strides to clarify their patent policies with regards to protecting AI innovations. For example, in the past few months, the USPTO has hosted a conference on AI policy considerations,[7] revised the subject matter eligibility guidelines,[8] and USPTO Director Andrei Iancu has spoken publicly about the patentability of AI-based innovations.[9] The EPO has also updated its examination guidelines to specifically include AI innovations,[10] likely a result of its May 2018 conference on patenting AI.[11]

These strides have brought the USPTO and EPO to roughly the same place with respect to patenting AI innovations,

despite the two jurisdictions starting at opposite ends of the spectrum. For example, U.S. law states that “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor.”[12] Thus, the U.S. has an initially broad standard on what constitutes patentable subject matter, with judicial rulings providing further limitations on eligible subject matter.[13] In the 2019 Revised Patent Subject Matter Eligibility Guidance,[14] the USPTO categorized these limitations into distinct areas: mathematical concepts, certain methods of organizing human activity, mental processes, laws of nature, and natural phenomenon, although it noted that subject matter directed to one of these areas may be patentable if it includes a “practical application.”[15]

Starting from the opposite end of the spectrum, the European Patent Convention specifically excludes “mathematical methods” and “programs for computers” from patentability.[16] Nonetheless, the EPO guidelines carve out that a “computer program having a technical character”[17] and artificial intelligence that contributes to a “technical purpose” may be patentable.[18] Notably, the EPO guidelines give examples of AI innovations that have the requisite technical purpose as those applying AI to a practical application in a technical field.[19]

Thus, at both the USPTO and EPO, the patentability of a claim related to AI (even if construed as a mathematical concept or computer program) depends on the practical application of the AI innovation in a given technical field.

Ensuring Novelty and Nonobvious

In both jurisdictions, it is also important to understand where the nonobvious innovation in the practical application of the AI lies. That is, stakeholders should avoid patent filings to “a known practice plus AI” While this may be novel, it is likely obvious. To identify the nonobvious innovation, stakeholders should focus on the technical improvement of their practical application of AI.[20] For example, in the EPO, technical distinctions are necessary for patentability,[21] and although the U.S. uses a flexible approach to determining obviousness,[22] as a practical matter, nontechnical distinctions are likely to be found obvious. Critically, this technical improvement should relate to how the AI for the practical application has been improved, not simply how the practical application has been improved by using AI.

For example, consider two hypotheticals. In a first hypothetical, a car company wants to determine the most popular car next year. The company has access to data on past sales. The company trains a machine learning algorithm on this data to predict the most popular car next year. The car company then files a patent application on using machine learning to determine the most popular car. This would likely not be patentable as using a machine learning algorithm to interpret data and create predictions on car data is an obvious practical application of the known machine learning techniques.

However, in a second hypothetical, a car company employee knows that (1) popular car colors are cyclical; (2) the most popular car color will repeat every three years; (3) and this car color cycle affects that year’s most popular car. This employee further finds that better results are obtained by preparing the data (e.g., normalizing car color data) according to the cycle prior to training the machine learning algorithm. This practical application of machine learning, which features a technical improvement to the AI is patentable. That is, the technical improvement (i.e., normalizing the data according to the car color cycle) provides a nonobvious benefit to the practical application of the AI application (i.e., determining the most popular car next year).

Conclusion

By reciting the technical improvement to the AI that is used for a practical application, stakeholders can ensure that their patent filing is both subject matter eligible and is not simply a “known practice plus AI.” As an additional benefit, identifying the technical improvement and describing the practical application will ensure that the innovation is adequately described in the patent filing (another requirement in the U.S. and Europe).

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[1] WIPO, Technology Trends 2019 “Artificial Intelligence” (January 31, 2019) available at https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf.

[2] *Id.* at 13.

[3] *Id.* at 14.

[4] *Id.* at 15.

[5] *Id.* at 39.

[6] *State Street Bank and Trust Company v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998); see also *Bilski v. Kappos*, 561 U.S. 593 (2010).

[7] USPTO, “Artificial Intelligence: Intellectual Property Policy Considerations” (January 31, 2019).

[8] USPTO, “2019 Revised Patent Subject Matter Eligibility Guidance” (December 20, 2018) available at <https://s3.amazonaws.com/public-inspection.federalregister.gov/2018-28282.pdf>.

[9] Andrei Iancu, Remarks delivered at the “Artificial Intelligence and Big Data Innovation: Navigating the Technology World of the Near Future” Panel, 2018 National Lawyers Convention (November 15, 2018) transcript available at <https://www.uspto.gov/about-us/news-updates/remarks-director-iancu-2018-national-lawyers-convention>.

[10] EPO, Guidelines for Examination in the European Patent Office (November 2018 edition) available at <https://www.epo.org/law-practice/legal-texts/guidelines.html>.

[11] EPO, “Patenting Artificial Intelligence” Conference (May 30, 2018) more information available at <https://www.epo.org/learning-events/events/conferences/2018/ai2018.html>.

[12] 35 U.S.C. § 101.

[13] See e.g., *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 217-18 (2014) (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66 (2012)).

[14] USPTO, “2019 Revised Patent Subject Matter Eligibility Guidance” (December 20, 2018) available at <https://s3.amazonaws.com/public-inspection.federalregister.gov/2018-28282.pdf>.

[15] *Id.* at 18.

[16] Article 52(a) and (c) EPC.

[17] EPO, Guidelines of Examination, Part G, Chap. II, 3.6.

[18] EPO, Guidelines of Examination, Part G, Chap. II, 3.3.1-3.3.2.

[19] EPO, Guidelines of Examination, Part G, Chap. II, 3.3.1 (“For example, the use of a neural network in a heart-monitoring apparatus for the purpose of identifying irregular heartbeats makes a technical contribution. The classification of digital images, videos, audio or speech signals based on low-level features (e.g. edges or pixel attributes for images) are further typical technical applications of classification algorithms.”).

[20] While the Supreme Court's decision in [KSR International Co. v. Teleflex Inc.](#) (KSR), 550 U.S. 398 (2007), cemented a flexible approach to determining obviousness, as a practical matter, non-technical distinctions are likely obvious. In contrast, in the EPO, technical distinctions are necessary for patentability. EPO, Guidelines of Examination, Part G, Chap. VII, 5.4.

[21] EPO, Guidelines of Examination, Part G, Chap. VII, 5.4.

[22] See [KSR International Co. v. Teleflex Inc.](#), 550 U.S. 398 (2007).

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