Machine learning: is there a limit to technological patents in Brazil?

On 31 January 2019 WIPO released its first report on a new initiative, which tracks technological development based on data analysis of innovative activities. Findings indicated an increase in AI invention filings and a considerable focus on machine-learning techniques.

There has been a great amount of media attention directed at these two technologies and their application in multiple sectors. This article focuses on how AI and machine learning are dealt with in the Brazilian patent system.

The complexity of these technologies and the speed at which they have developed partially explain the reason why accurate – and final – definitions have not yet been established. For the purposes of this article, 'AI' refers to machines that can perform tasks that, if performed by a human, would be said to require intelligence (Matthew U Scherer, "Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies", *Harvard Journal of Law & Technology,* No 29, 2016), while 'machine learning' is understood as the changes in systems that allow them to perform tasks such as recognition, diagnosis, planning and prediction, as enhancements or a starter pack for new programs (Nils J Nilsson*,* "Introduction to Machine Learning", Department of Computer Science, Stanford University 1998).

Given the definition of these concepts, questions as to how these seemingly abstract and opaque technologies translate into patent applications arise.

According to the Industrial Property Law (9279/96), a patentable invention must meet the requirements of novelty, inventive step and industrial application. An object of practical use, or a part thereof, is patentable as a utility model if it is suitable for industrial application, presents a new shape or arrangement and involves an inventive act that results in a functional improvement in its use or manufacture. This means that invention and utility models are considered to be new when they can be made or used in any kind of industry and are neither included in the state of the art, nor derived in an obvious or common manner from it.

In addition, the law excludes mathematical methods and computer software from patent protection, the latter being protected by copyright law, since they do not meet the necessary requirements. Due to this, some technologies are not patentable. This includes most algorithms, which are defined as 'mathematical calculations aimed at ranking and filtering information'.

Therefore, AI contains patentable parts, as it comprises more than a computer code or algorithm, and includes, in a number of cases, a physical and more concrete aspect. However, the technology behind machine learning does not lead to the same clear conclusion.

Machine learning is an auto-improving system that processes and analyses large amounts of data. It systematically refines its results when new and updated data is received. Face recognition technology used by social media networks is an example of

machine learning. It analyses photos that a user either uploads or is tagged in to improve its internal mechanism and can then detect visual material in which the user appears without tagging.

Machine learning combines statistics and mathematical calculations to detect patterns and provides programmed results. It therefore lies somewhere between algorithms and AI. Since these three technologies are usually included in the same system or mechanism, separating their features to determine what should (and can) be patented is a complex process.

Nevertheless, through the scope of the Industrial Property Law, a patent application exclusively based on machine learning may require clarification as to why this technology does not fall within the definition of mathematical method or computer software.

According to the National Institute of Industrial Property (INPI), 'computer software' refers to the literal elements of a creation (eg, a group of instructions written in codified language). Since this code is an expression of a technical solution and dependent on the programming language, it does not constitute a patentable invention.

However, INPI has stated that computer software may be patented if it is part of an industrial creation that solves a technical issue and is not exclusively related to how the software is written. In this case, protection covers the whole system in which the technology is included, not the program's code (or its calculations and statistics), which are protected by copyright law only.

Therefore, considering that machine learning is an enhancement system that functions through calculations, if this technology is part of a device that is not entirely focused on code (eg, AI) and also fulfils the patentability requirements, it can be patented as a method. In this scenario, machine-learning technology is not reduced to a mathematical method or computer software, because it is part of a larger structure.

Brazilian patent legislation can therefore hinder the protection of certain technologies by other means than copyright law.

Conclusion

Despite INPI's attempts to justify the patentability of machine learning, the Industrial Property Law does not cover the basis of this technology (ie, what constitutes machine learning). Based on current legislation, INPI requires the internal characteristics and purposes of machine learning to be more complex in order to grant patent protection. This renders a great part of this type of technology unpatentable, restricting its protection to copyrights.

Limiting the protection of this type of technology to copyright law subjects these systems into a legal regime that may not be suitable for its purpose. Considering the development process of creating machine-learning technology, determining authorship would most likely cause a series of discussions, judicial or otherwise, in order to establish its rightful owner, who would be entitled to control and decide the technology's distribution and sale.

Legislators should consider adapting current IP legislation to the features of modern intellectual works. This would create a more favourable environment for the development, evolution and protection of these technologies.