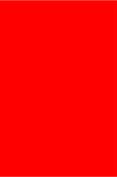# WIPO Conversation on Intellectual Property and Frontier Technologies. Sixth Session: AI inventions

IA ALGORITHMS/MODELS

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Presentation content

IA ALGORITHMS/MODELS

- Introduction: What is artificial intelligence "AI"?

- AI algorithms/models: machine learning and deep learning.

- Protection of AI algorithms and models: software patenting; copyright; trade secrets.

- Some challenges and final thoughts.

What is artificial intelligence "AI"?

- "The science and engineering of designing intelligent machines."

- "A discipline of computer science whose object is to devise machines and systems that can perform tasks requiring human intelligence, with limited or no human intervention."

- These techniques add to the systems several additional complexities that allow them to "learn," "adapt," act "autonomously," make "inferences" and "recommendations" from large amounts of data.

(McCarthy, 2007; WIPO, 2020)
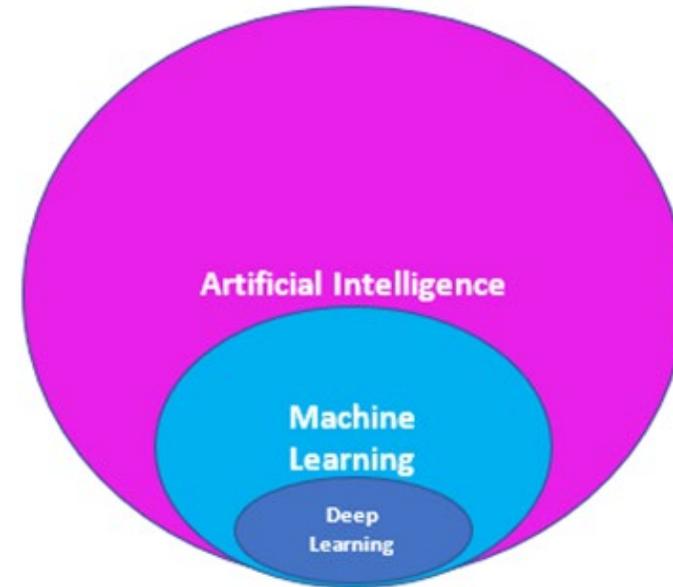
What is artificial intelligence "AI"?

- Much of what we know today as AI is situated in the use of "programmed techniques and applications to perform specific tasks" which is integrated into the concept of so-called "weak AI."

- All these AI "capabilities" are imitations of human capabilities, built by humans to optimize certain tasks so that AI in the current state of the art is a tool.

- AI systems are complex to explain because, on the one hand, due to their characteristics they are or may be protected in themselves by the intellectual property system, insofar as they are expressed through computer programs or may consist of inventions implemented through software. And, on the other hand, some of these systems have the "capacity" to generate products that, in turn, could eventually be protected by intellectual property (IP) regimes.

(WIPO, 2020)

AI ALGORITHMS/MODELS

Machine learning (ML): is a subfield within AI that seeks to provide machines with the ability to "learn" from experience without the need to be explicitly programmed.

Deep learning (DL): It seeks to enable algorithms to learn to recognize patterns in data. Deep learning uses neural networks that are so named because they mimic the functions of the human brain and are built with multiple layers which, together with other available processing capabilities, enable learning in very complex tasks.

Relationship between artificial intelligence, machine learning and deep learning.

Own elaboration, adapted from European Parliament (2022, p. 3)[v]

PROTECTION OF IA ALGORITHMS/MODELS

- Although much of the discussion on the interactions between AI and IP has focused on the capacity of certain systems to generate what could be works or inventions, there are other interactions and, therefore, other discussions as well.

- One of them relates to the fact that as can be seen, in all the models mentioned, some of the technical components of AI are repeated, which at a minimum require: software, algorithms and data, in some cases also hardware.

- There may be different forms of protection through the intellectual property system and this, in turn, may generate some tensions between this system and new principles and rights that are beginning to develop around regulations on artificial intelligence.

Patentability of artificial intelligence systems

- Article 27 of the "Agreement on Trade-Related Aspects of Intellectual Property Rights": patent protection is available for inventions in all fields of technology as long as they are not excluded from patentability.

- Requirements of novelty, inventive step and industrial applicability, but in addition the invention must be among the "patentable subject matter."

- In those cases where there is no exclusion, for an AI system to become patentable it also requires compliance with the aforementioned requirements.

- Many legislations exclude from patentable subject matter computer programs and algorithms to the extent that they can be considered abstract ideas, mathematical methods, rules and mental activities or mere scientific or logical principles applied to the solution of technical problems.

- The protection of computer programs per se may not be that offered by the patent system, but that offered by the copyright system.

Patentability of artificial intelligence systems

- AI can be more than just software; it can have other technical components that allow, for example, that such software can be incorporated into an apparatus, machine or mechanism to implement an invention.

- In the latter case, inventions implemented by computers or machines could be patentable to the extent that the aforementioned requirements are met.

- Thus, in those cases in which a technical effect is obtained and a technical problem is solved through a technical result, the exclusion of the computer program as such ceases to apply and the invention could become patentable as a whole.

Copyright protection

- "Computer programs, whether source programs or object programs, shall be protected as literary works under the Berne Convention (1971).2 [...]". (TRIPS Agreement, Article 10.1).

- Many jurisdictions protect computer programs through copyright rules. This system offers a more flexible mechanism with fewer formalities than the patent system that can also be extended to AI systems.

Copyright protection

- It is not the mere "idea" of what the program should do that is protected, but a computer program with all the instructions in code necessary for it to work. That expression (the program) would be a copyrightable work, whereas the general idea (the algorithm) is "only vaguely related to it".

- Moreover, protection extends to all forms of expression of the program (both the source code and the object code) but does not extend to the functional aspects, since they do not constitute a form of expression of the program for copyright purposes.

- This means that protection is in fact limited, despite the great importance that these non-protected elements, for example, the functionalities of the program, may have in the world of innovation.

(Nova Productions Ltd. c. Mazooma Games Ltd., Nova Productions Ltd. c. Bell Fruit Games Ltd; Guzmán, 2022).

Trade secret protection

- There may be difficulties in patenting AI systems and algorithms.

- Copyright protection may be insufficient.

- Algorithms have difficulties in qualifying as works and because they are usually considered outside patentable subject matter since in many cases they are equated with "mathematical methods."

- In view of this, and also for economic and commercial reasons, certain algorithms are currently protected as trade secrets.
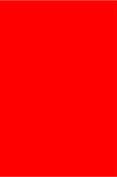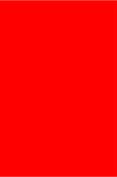
Trade secret protection

Requirements

- Be secret, in the sense of not being generally known or easily accessible to the circles in which they would normally be used;

- Have business value as a result of their secrecy;

- Reasonable steps must have been taken by the owner to ensure that it remains secret.

(Article 39 TRIPS)

CHALLENGES, IMPLICATIONS AND FINAL THOUGHTS

- Implications of the secrecy of databases and algorithms.

- There are new requirements and principles that seek to ensure that AI systems do not infringe fundamental rights.

- Of particular relevance to the intellectual property system are those related to the transparency, explainability and auditability of AI systems.

- Preventing unwanted biases requires measures to be articulated so that developers can have more and better data.

- Many of these measures are -or can be- found in intellectual property legislations.

CHALLENGES, IMPLICATIONS AND FINAL THOUGHTS

Balanced legal and technological solutions must be implemented to ensure such transparency and access, without losing sight of the fact that artificial intelligence is a key factor for economic, social and cultural development, so private investment in AI must be protected in order not to slow down innovation in the area.