



Date: 2019-11-07

Director of the United States Patent and Trademark Office
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Submitted via email to: AIPartnership@uspto.gov

Re: Request for Comments on Patenting Artificial Intelligence Inventions

On behalf of Telefonaktiebolaget LM Ericsson (publ) ("Ericsson"), we are pleased to submit the following comments in response to the Request for Comments on Patenting Artificial Intelligence Inventions published in the Federal Register on August 27, 2019.

Ericsson is a Swedish multinational networking and telecommunications company headquartered in Stockholm. The company was founded in 1876, employs 95,000 people, and operates in over 180 countries. Ericsson is dedicated to research and innovation, leading the development of cellular technology—from 2G to 5G—and 40% of the mobile traffic worldwide runs through Ericsson's networks. Today, mobile networks experience massive amounts of data every second. For example, on a mobile network in the US, 4 terabits of data cross the network every second and 15 million data events are registered.

We have spent over a decade innovating and deploying AI & Automation solutions across our products and services, to boost network performance, improve the end-user experience, enhance operational efficiency, and enable new revenues for our customers. In June 2019 Ericsson announced plans to build its first US fully-automated smart factory. The state-of-the-art factory will produce Advanced Antenna System radios to boost network capacity and coverage, including rural coverage, as well as 5G radios for urban areas, both necessary for rapid 5G deployments in North America. On September 19, 2019, we announced that this USD 100 million next-generation smart manufacturing factory will be located in Lewisville, Texas, near Ericsson's North America headquarters in Plano. Our interest in ensuring sound patent policy in AI and related technology is therefore closely related to our U.S. innovation and work in this area.

Ericsson

IPR & Licensing – Patent Development



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We appreciate that AI is a new and developing technology, and the role it plays in patentable inventions and the speed with which it is integrated into our patent system may change dramatically over time. For now, we offer feedback based on our current understanding of the AI landscape. We thank the USPTO for this opportunity and provide our answers to the twelve questions below.

Questions

1. Inventions that utilize AI, as well as inventions that are developed by AI, have commonly been referred to as "AI inventions." What are elements of an AI invention? For example: The problem to be addressed (e.g., application of AI); the structure of the database on which the AI will be trained and will act; the training of the algorithm on the data; the algorithm itself; the results of the AI invention through an automated process; the policies/weights to be applied to the data that affects the outcome of the results; and/or other elements.

We believe that "AI inventions" may be broken down into at least the following categories: inventions directed to new AI/machine learning (ML) hardware or software systems/techniques, inventions that adapt AI/ML to solve a specific non-AI problem or that use AI/ML as a black box to solve a problem (or part of a problem), and inventions where an AI tool is used to invent something which is not necessarily AI.

Based on this categorization, and since AI may be applicable in a wide number of technology areas, elements of an AI invention may vary a lot from one invention to another and cannot easily be named. The elements named in our answer may be elements of an AI invention, but there could be other elements as well.

2. What are the different ways that a natural person can contribute to conception of an AI invention and be eligible to be a named inventor? For example: Designing the algorithm and/or weighting adaptations; structuring the data on which the algorithm runs; running the AI algorithm on the data and obtaining the results.

Based on the categories enumerated in the response to question 1, a natural person can contribute to the conception of an AI invention by advancing the art of AI. Furthermore, we believe that currently available AI can be viewed as a tool that might help natural persons to create new



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inventions. In these situations, these natural persons may be eligible as inventors if they were the persons who programmed the AI, the persons who set up the problem for the AI to solve, or the persons who made and/or selected the data to be used by the AI.

3. Do current patent laws and regulations regarding inventorship need to be revised to take into account inventions where an entity or entities other than a natural person contributed to the conception of an invention?

For the foreseeable future, and since we consider that AI is still just a tool, intervention from natural persons will still be needed to make inventions and as such natural persons should still be named inventors.

Once Artificial General Intelligence (AGI) exists, since there is a need for intellectual property rights (IPR) for AI-generated inventions, the concept 'inventor' may have to be revised accordingly. Specifically, the more intelligent the AI becomes (including the data set it has at its disposal), the less contributions from natural persons are needed for the AI to invent. However, Ericsson currently has no firm opinion on whether the existing patent laws need to be revised to cater for AGI or whether a new form of IPR law is needed for that purpose. We do believe that a significant amount of time may pass before such a need arises, and revising the laws and regulations regarding inventorship may be premature at this time.

4. Should an entity or entities other than a natural person, or company to which a natural person assigns an invention, be able to own a patent on the AI invention? For example: Should a company who trains the artificial intelligence process that creates the invention be able to be an owner?

We believe that the party that paid for the AI, made the AI, or paid for the related context in which the AI was utilized to make the invention should be able to own any resulting patents.



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5. Are there any patent eligibility considerations unique to AI inventions?

We do not believe there are specific eligibility considerations that are unique to AI inventions in the US.

6. Are there any disclosure-related considerations unique to AI inventions? For example, under current practice, written description support for computer-implemented inventions generally require sufficient disclosure of an algorithm to perform a claimed function, such that a person of ordinary skill in the art can reasonably conclude that the inventor had possession of the claimed invention. Does there need to be a change in the level of detail an applicant must provide in order to comply with the written description requirement, particularly for deep-learning systems that may have a large number of hidden layers with weights that evolve during the learning/training process without human intervention or knowledge?

We do not believe there are specific disclosure-related considerations that are unique to AI inventions in the US.

7. How can patent applications for AI inventions best comply with the enablement requirement, particularly given the degree of unpredictability of certain AI systems?

We believe that the level of detail that an applicant must provide to comply with the enablement requirement in the US should be the same for AI inventions and non-AI inventions.

8. Does AI impact the level of a person of ordinary skill in the art? If so, how? For example: Should assessment of the level of ordinary skill in the art reflect the capability possessed by AI?

We do not believe that AI impacts the level of a person skilled in the art, at least as long as AGI does not exist. However, availability and use of AI tools may become natural for a person of ordinary skill in the art.



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9. Are there any prior art considerations unique to AI inventions?

We believe that what constitutes prior art in the US should be the same for AI inventions and non-AI inventions.

10. Are there any new forms of intellectual property protections that are needed for AI inventions, such as data protection?

Since we currently view AI primarily as a tool, the existing IPR systems should offer adequate protections. However, the existing IPR systems may need to evolve also in order to provide adequate protections for AI-generated inventions. As mentioned in the answer to question 3, Ericsson does not at the moment have a firm opinion on which legislative route to take.

11. Are there any other issues pertinent to patenting AI inventions that we should examine?

We do not believe there are any other pertinent issues to be examined at this time.

12. Are there any relevant policies or practices from other major patent agencies that may help inform USPTO's policies and practices regarding patenting of AI inventions?

We believe that collaboration with other major patent agencies is generally beneficial, and therefore, collaboration with WIPO and IP5 should continue. Such collaboration may provide flexibility and the possibility to adapt practices to AI inventions, without the need for time-consuming or challenging legislative changes.

Sincerely,

Gabriele Mohsler

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