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To the
Director of the U.S. Patent and Trademark Office
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Dear Director of the USPTO,
Dear Andrei,

It was a pleasure meeting you during the WIPO Conference on Artificial Intelligence in Geneva, last week.

Already from the questions asked in the above-mentioned document, it becomes clear that the USPTO is on top of the issues in connection with AI inventions. I am therefore very happy to submit my personal and Siemens' comments on patenting AI inventions. In fact, at Siemens we see AI applications in all fields of technology, we make use of it as a tool and we even see the first AI created inventions. Due to technical progress in computing power, AI has become a technology that has extremely fast spread out within a few years in all sorts of technologies and applications although its basic roots are already more than fifty years old. Siemens has always been at the forefront of AI development and is proud to be regarded as one of the leading patent owners of AI patents according to a recent WIPO study on AI Patents.¹

To the specific questions:

1. We basically distinguish three types of AI inventions:
 - a. Inventions covering basic principles of AI such as algorithms, data structures, program architectures etc. These inventions are computer-implemented invention and should not be treated differently.

¹ https://www.wipo.int/tech_trends/en/artificial_intelligence/story.html

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- b. Application inventions of AI: The focus of these inventions is not so much on the basic structures and mechanisms of AI but on its application for different technologies like control systems, predictive maintenance systems, data analytics etc.
- c. Inventions created by AI systems themselves. Deep AI systems like self-learning systems have the potential to become creative themselves. In the field of patenting, such AI systems would e.g. be able to create software codes, to design mechanical novel products or to synthesize novel chemical compounds or materials that comprise non-obvious, for one of ordinary skill surprising features.

Another important element of an AI system are data. Without any proper training data, an AI system is worthless. But we think patents are not the appropriate IP right for the protection of data. Rather, copyright, competition law, or sui generis rights could be more appropriate to protect data.

- 2. For inventions of above-mentioned type 1a, the natural person that has contributed to the development of the algorithm, data structure or program architecture should be named as inventor.

For application inventions of type 1b, the natural person that contributed to the development of the AI application should be named as an inventor.

For AI created inventions like 1c, the question is more difficult. If we focus on AI systems that are by deep learning features able to create new and unexpected codes or products themselves, a natural person has not creatively contributed anymore. A natural person might have turned on the AI system, fed it with data or just simply have had the idea to use an AI system. The creativity, however, lies in the AI system. In order to name an inventor for such an invention, there are three options:

- (1) either a natural person is pretended as inventor, or
- (2) the machine is named as inventor, or
- (3) the term of inventor is expanded to the legal person that controls the AI system.

The last approach would have the great benefit that it is honest and names the person that is responsible for an AI system. Since a machine is not entitled to any rights and has no duties, it should also not benefit from being named as inventor. Legal persons, however, have such rights and duties and are responsible and accountable for using AI systems and are therefore the proper choice to be named as inventor.

- 3. Yes, for inventions that have been purely conceived by an AI system the inventor should be enhanced to legal persons controlling (i.e. using and being responsible for) the AI system.
- 4. Yes; We don't think that ownership is the problem because ownership of inventions by legal persons is possible already today e.g. for employees' inventions. The problem lies in the inventorship which according to current interpretation of the law is limited to natural persons. This, however, is because until recently, it was just not conceivable that anybody else than natural persons could be creative or inventive. With the development of self-learning AI systems, this has changed. Attributing inventor or ownership rights to machines doesn't feel right. Therefore, we suggest expanding the right of the inventors to legal persons controlling the AI systems. This approach must be further defined properly by legislation because ownership, possession or use of an AI system is maybe not enough. The legal person that is responsible and accountable for using an AI system, i.e. that has the duty to make sure that the AI system is not getting out of control or

creates socially unbearable results, should in exchange of taking such responsibility also be entitled to the inventor rights.

5. No; AI inventions are computer-implemented inventions and as regards patent eligibility should not be treated differently than computer implemented inventions.
6. We think, no unique disclosure-related considerations should be applied for AI inventions. In the same way as for computer-implemented inventions, the application should be described in a way that a person skilled in the art can understand it. That means, the algorithm, data layers structure and eventually the training data must be disclosed if it is an AI created invention. Black box inventions should be avoided. On the other hand, if AI is used only as a tool and standard AI technologies are used, a person skilled in the art will be able to understand the invention without any details of the AI system used.
7. See above under 6.
8. If AI tools are tools available to a person of ordinary skill in a field – and thus AI created inventions are possible – e.g. AI searching tools should also be an allowed tool for the fictious person of ordinary skill. As a result, the hurdle of non-obviousness will increase but this might be a wanted balancing effect to limit the number of (automated) AI created inventions.
9. No, except that AI searching tools will facilitate the prior art search.
10. As mentioned earlier, AI systems without any data are worthless. Therefore, data collections, in particular intelligently put together data collections, will play a more and more important role. Sui generis rights for data protection might indeed be a solution.
11. We think the most important topics are covered by this catalogue of questions.
12. We are not aware of any other relevant policy or practice. Rather, we think with this consultation the USPTO is in a leading position.

To summarize, we think AI inventions should not be treated differently than other computer-implemented inventions. For truly AI created inventions, the term inventor should be extended to legal persons to avoid a discrimination of AI technologies over traditional ones.

We thank the USPTO having given us the opportunity to participate in this consultation.

With best regards,

Siemens Aktiengesellschaft



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