

AIPPI Q276-SGL-P-2021 – Inventiveness and sufficiency of disclosure in AI inventions

Report of the Swiss Group

I. Introductory remarks

For the purpose of this Study Question, an invention is deemed to involve Artificial Intelligence (AI), if the invention was made using AI, and/or the invention comprises (new or improved) AI, hereinafter referred to as «AI Inventions».

While machine learning (ML) is often acknowledged as one of the fundamental concepts of AI, the boundaries of AI are not well defined. Machine learning concerns cognitive algorithms: a training algorithm is used to train a cognitive model through examples for it to automatically learn its own parameters and thereby improve through the examples. Various types of training algorithms and cognitive models are known. Examples of cognitive models are decision trees and artificial neural networks (ANNs).

According to a certain interpretation, AI only overlaps with ML, insofar as AI would further imply an entity that dynamically interacts with its environment to learn, as opposed to ML methods that passively learn thanks to training data fed by human users.

So, for the purpose of the study question, AI is considered to at least include ML, even unsupervised ML. However, beyond the core ML, an AI entity may further include additional components enabling the AI entity to interact with its environment, as opposed to unsupervised ML.

II. Legal sources

Federal Act on Patents for Inventions (Patents Act, PatA); Swiss Patent Ordinance (PatO); Swiss Federal Patent Court (FPC) case law; Swiss Federal Supreme Court (FSC) case law.

III. Current law and practice

Please answer the below questions with regard to your Group's current law and practice.

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The english translation of the summary is included online only.

Inventiveness

1.

When assessing Inventive Step under your law, are the concrete/actual circumstances under which an invention was made (e.g., the amount of time and resources used by the concrete inventor) considered at all, or is the assessment of the Inventive Step rather an objective examination of the invention against the prior art? Please briefly explain.

The assessment of the inventive step is rather an objective examination of the invention against the prior art.

No substantial examination is performed at the Swiss Federal Institute of Intellectual Property (IPI). In particular, there is no examination for inventive step by the IPI. However, Swiss courts may, in the event of a dispute and depending on requests and allegations of the parties in the case at hand, potentially have to assess all patentability requirements, including those related to Inventive Step.

The Federal Act on Patents for Inventions (PatA) is not effort-based or per se investment-protective, but rather focuses on the innovative contribution to technology.

The standard for inventive step as defined in the Federal Act on Patents for Inventions (Art. 1(2) PatA) essentially corresponds to Art. 56 of the European Patent Convention (EPC). Swiss National Courts are generally inclined to adopt the standards of the European Patent Office (EPO) and follow guidance from the standard of the Boards of Appeal of the EPO (see, e.g., FSC, 28 February 2007, BGE 133 III 229, 331, under section 3).

In accordance with the EPO's approach, an invention is considered to involve an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art. According to established case law, the EPO assesses the inventive step of computer implemented inventions – to which most AI inventions belong – using the so-called COMVIK approach (EPO, 12 September 2002, T 0641/00, «Two identities/COMVIK»). Accordingly, the inventive step of an invention comprising a mixture of technical and non-technical features and having technical character as a whole must be assessed taking into account all those features which contribute to said technical character. By contrast, features which do not make such a contribution cannot support an inventive step.

Next, the inventive step of the features contributing to the technical character is objectively assessed against the

prior art. While secondary indicators may, in principle, also be considered, such indicators usually do not include the concrete/actual circumstances under which an invention was made, unless such circumstances are reflected in the claims. Circumstantial information on the development process can be helpful to understand the invention, but usually has little importance for the patentability.

2.

Further to question 1, when assessing Inventive Step ...

Comments on Question 2: This Group considers that Question 2 addresses two different scenarios, and therefore answers the two scenarios separately.

a) ... does your law differentiate between an invention made by a human being using AI technology and inventions made autonomously by AI?

No.

Swiss law does not make such a distinction. In fact, Swiss law does not contain statutory provisions that specifically concern the patentability of AI-related inventions or, more generally, computer-implemented inventions (CIIs). Rather, the statute (and commentaries on it) presuppose that an invention is conducted by a human being (inventive leap). Although the PatA does not expressly state a particular threshold of human control or input in the inventive process, the wording of the statute frames the questions on inventorship in terms of human creation and the justness and importance of rewarding human effort and stimulating human creativity. Nothing in the Swiss law prevents applicants from filing patent applications directed to inventions made by human beings using AI technology. However, various provisions of Swiss law implicitly exclude the possibility for an AI entity to be named as inventor in a patent application. According to Swiss law, an inventor is a natural person from whom the technical creation constituting an invention originates. Thus, a patent application directed to an invention made autonomously by AI would have to name a human inventor.

Since any patent application presumably has to name a human inventor, the underlying invention will be assumed to have been made, at least partly, by a human being. Thus, in practice, there is no need for the Swiss law to differentiate between an invention made by a human being using AI technology and an invention made autonomously by AI.

Note, however, that it is questionable whether an invention can be made autonomously by AI: see REPORT OF THE SWISS GROUP, *Inventorship of Inventions Made Using Artificial Intelligence* (Q 272), sic! 2020, 583.

b) In particular, assuming that a specific invention could have been made using AI without Inventive Step, is the invention still patentable if the applicant claims that the invention was made without using AI? Please briefly explain.

An AI system or method that is publicly available at the effective filing date is to be considered as prior art.

Assuming that a specific invention could have been made using such an AI system or method without inventive step, the claimed invention may thus well be found not to be patentable if this AI system or method happens to be identified as prior art, whether the applicant claims that the invention was made with or without use of AI.

3.

The following questions relate to the definition of the person skilled in the art when assessing Inventive Step of an AI Invention under your law:

a) What is the definition of the «person skilled in the art»? An AI «person»? A human person? A human person having access to AI? Does the increasing use of AI in the inventive process change the definition of the person skilled in the art? Please briefly explain.

A person «skilled in the art» is defined as a human person having access to AI, who possesses average knowledge of and ability with AI.

As said, Swiss law does not contain statutory provisions that specifically concern the patentability of AI-related inventions. Also, Swiss law does not provide a definition of a person skilled in the art. Following the EPO's approach, the definition used by the Swiss courts is that a person skilled in the art is presumed to be a skilled practitioner in the relevant field of technology who possesses average knowledge and ability and is aware of what was common general knowledge in the art at the relevant date (see, e.g., BGer vom 2. Oktober 2014, 4A_142/2014).

In the field of AI and, in particular, ML, one typically expects the person skilled in the art to have average knowledge in terms of, inter alia, data pre-processing, running (if not devising) ML-related algorithms (such as relating to feature extraction and backpropagation), and data post-processing.

However, with the on-going democratization of AI, not only computer scientists but also practitioners in various fields are now able to implement AI-related methods. The skill level required to implement AI for a specific task is therefore decreasing.

Furthermore, the skilled person is presumed to have had at their disposal the means for routine work and experimentation which are normal for the field of technology in question. Such means does – in more and more technical fields – comprise AI tools.

The increasing use of AI in the inventive process will likely be perceived by the courts as a normal evolution, not only in the field of computer-related inventions but also in other fields. This will presumably not require any change to the current definition of the person skilled in the art.

b) What kind of «skills» (e.g., access to software) does this «person» have in the specific context? Please briefly explain.

See answer to Question 3.a).

c) Do the capabilities of AI impact the assessment of the skillset of the person skilled in the art? In particular, do the capabilities of AI to process a high amount of theoretical solutions of a given problem impact the assessment of the skillset? Please briefly explain.

Swiss law does not explicitly address the impact of AI on the skillset of the person skilled in the art. However, this Group believes that there is no need for the law to specifically address this issue.

A parallel can be made with the Internet, for instance. Like the Internet a few decades ago, the advent of AI expands the possibilities of many actors, including these in the fields of data sciences, computer sciences, and software engineering. Thus, the definition of the capabilities of the skilled persons will likely be impacted as AI techniques rapidly evolve and expand. Similarly, the Internet allows anyone to quickly find solutions addressing a particular problem. However, the advent of the Internet did not necessitate changing the definition of the capabilities of the person skilled in the art.

Whether AI can process a large volume of theoretical solutions of a given problem is misleading. In practice, it is true that modern computers can process a vast amount of data (e.g., compared to computers of the 1990s); and it is also true that some ML algorithms require massive amounts of training data to perform. This, however, is more of a disadvantage than an advantage. Moreover, ML algorithms basically ingest numbers and output numbers. How such numbers are mapped onto problems and solutions is typically the result of human activities, not of AI.

Where the inventive step boils down to recognizing an invention amongst a multitude of theoretical solutions corresponding to outputs of an AI system, the same standards as for the assessment of the obviousness of a selection from a number of known possibilities may possibly be applied (see, e.g., G-VII Annex 3 EPO Guidelines for Examination).

d) Does your law treat common general knowledge differently for AI inventions? Please answer YES or NO, and you may add a brief explanation.

No.

As said, Swiss law does not contain statutory provisions that specifically concern the patentability of AI-related inventions. However, patentability requirements are normally agnostic to the technical field. Thus, there is no reason to expect that Swiss courts will treat common general knowledge differently for AI-related inventions.

4.

Further to questions 2 and 3, under your law, how is the Inventive Step assessed in the following hypothetical cases (you may answer whether Inventive Step is met by answering YES or NO, but you also may add a brief explanation):

a) A publicly available AI system is trained using publicly available training data. The trained AI system is used to make a suggestion for a technical solution based on publicly available data (e.g., the invention is in the pharmaceutical field, the AI system was trained using structural information and binding data of molecules binding to a target protein and inhibiting its physiological function. The suggestion for the technical solution is a new molecule selected from a library of molecules and predicted to bind to the target protein and inhibit its physiological function).

b) A publicly available AI system is trained using publicly available training data. The trained AI system is used to make a suggestion for a technical solution based on not publicly available data (e.g. a library of molecules available only to the applicant).

c) A publicly available AI system is trained using not publicly available training data (e.g., unpublished experimental results obtained by the applicant). The trained AI system is used to make a suggestion for a technical solution based on publicly available data.

d) A not publicly available AI system is trained using publicly available training data. The trained AI system is used to make a suggestion for a technical solution based on publicly available data. The AI system relies on commonly used AI principles and leads to the same result as another publicly available AI system commonly used in the technical field of the invention.

e) A publicly available AI system is trained using publicly available training data. The trained AI system is used to make a suggestion for a technical solution based on publicly available data. The AI system is not commonly used in the technical field of the invention.

f) A publicly available AI system is trained using publicly available training data. The trained AI system makes a plurality of suggestions for technical solutions based on publicly available data. A human selects one of the suggestions as the most promising based on his/her experience.

To date, Swiss case law remains silent as to the inventive step of AI-related inventions. However, as noted earlier, Swiss courts are generally inclined to adopt the EPO standards and follow guidance from the standard of the Boards of Appeal of the EPO.

The inventive step assessment concerns the claimed subject-matter, as such, in view of the prior art. As with any other types of inventions (starting with computer-related inventions), the inventive step of AI-related inventions is

assessed according to the established EPO practice (i.e., by taking account of all those features which contribute to the technical character). This assessment, however, pays little attention to the manner in which the invention has been made. For example, a new molecule or a new use of a known molecule is assessed in view of molecules and chemical groups that are already known to solve a similar problem or have a similar function, irrespective of the way the new molecule was identified (whether using books, AI, or ab initio methods, for example).

Many factors may potentially impact the inventive step of AI-related inventions, whether related to input data (pre-processing), the core AI methods, or the post processing of output data. In the recent EPO decision 3M Innovative Properties (11 December 2020, T 755/18), the board argued that «[i]f neither the output of a machine-learning computer program nor the output's accuracy contribute to a technical effect, an improvement of the machine achieved automatically through supervised learning to generate a more accurate output is not in itself a technical effect». However, care should be taken not to draw erroneous conclusions by generalizing this statement regardless of the actual context of the decision. In particular, the contrapositive of the catchwords (interpreted as an «if-then» statement) seems to imply that only the output of ML can possibly contribute to the technical character. This is obviously not true in general since there are other potential sources of technical character. For instance, the core ML algorithm may possibly involve a specific memory and/or I/O management, which may well have technical character.

How the inventive step will be assessed by the Swiss courts in the cases above is difficult to answer due to the dearth of case law, also at the EPO. In addition, the answers to such questions will likely be strongly dependent on the particulars of the cases at hand.

In general, the courts will strive to assess the inventive step in an objective way, by comparing the claimed technical subject-matter to the prior art (e.g., using the problem-solution approach).

That the AI system and/or the training data are publicly available may perhaps be used to question the inventive step of a claimed solution. However, inventive step objections must be based on reasoned statements. Thus, the extent to which the publicly available system and data are documented may play an important role. In addition, technical prejudices in the technical field at issue may be considered too (e.g., is AI a well-known means of solving the problem of the invention at the date of the invention?).

As a further comment, this Group wishes to remind that AI methods revolving around ML can be compared to statistical inference methods. As such, inferences obtained with a trained ML algorithm may possibly be regarded as «statistically normal» outputs. Accordingly, if the ML model has been trained *based on known examples*, patent courts may possibly regard its outputs as lacking

an inventive step. Conversely, the conclusion may differ if the ML model has been trained *based on unknown examples*. The latter situation, however, raises additional questions in terms of sufficiency of disclosure, inasmuch as such examples would have to be sufficiently described, in addition to the ML model.

5.

Assuming that an AI system becomes standard for solving technical problems in a certain technical field, does the Patent Office in your country use this AI system during examination of a patent application? Please answer YES or NO, and you may add a brief explanation.

Remark: It is not fully clear from the wording of the question, whether the «use of this AI system during examination» refers to using this AI system as: a) a tool, or b) prior art to challenge the patentability of the invention.

- a) The Swiss Patent Office does not carry out a substantive examination and thus does not examine inventive step. Nevertheless, like other patent offices, the Swiss Patent Office likely uses AI tools in carrying out prior art searches.
- b) Any AI technique that is publicly available at the effective filing date may potentially be identified as prior art, and/or a well-known means available to the person skilled in the art, e.g., for routine work and experimentation. See also the answer to Question 2.

Sufficiency of disclosure

6.

Please briefly describe the standard of sufficiency of disclosure under your jurisdiction.

According to Art. 26 PatA, Swiss courts may come to declare the nullity of a patent if the claimed invention is not described in the patent specification in a manner sufficiently clear and precise for it to be carried out by a person skilled in the art. In addition, Art. 26 of the Swiss Patent Ordinance (PatO) provides that the description must describe the invention in a manner that allows the technical problem and its solution to be understood. It must contain at least one embodiment of the invention unless it is sufficiently disclosed in another way.

Features that are essential for carrying out the invention must be sufficiently disclosed. These may notably include contributions giving entitlement to inventorship. In that respect, Resolution 2020 «Inventorship of inventions made using Artificial Intelligence», adopted by the AIPPI World Congress in October 2020, lists the following contributions whereby the author thereof is to be considered inventor: use of an AI algorithm to design a particular type of product or process, design of an AI algorithm, selection of a data source for training an AI algorithm, selection or generation of data or data source for input to a trained AI algorithm, recognition that an output of an AI algorithm constitutes an invention (see points 4.a to 4.e of the Resolution).

7.

Further to Question 6, does your law provide exceptions from the standard of sufficiency of disclosure? Please answer YES or NO, and you may add a brief explanation.
Yes.

According to Art. 50a PatA, if an invention relating to biological material cannot be sufficiently described, then the description must be completed by depositing a sample of the biological material. In that case, the description must provide details of the essential characteristics of the biological material as well as a reference to the deposit.

8.

Does/did the increasing use of AI change the standard of sufficiency of disclosure? Please answer YES or NO, and you may add a brief explanation.

No.

The advent of AI has not changed the standard of sufficiency of disclosure in Switzerland.

A report by the EPO expert round table on artificial intelligence (31 October 2018), alongside the other IP5 Offices regarding disclosure requirements in AI¹ refers to «some flexibility» in the application of the requirement of sufficiency of disclosure despite strict disclosure requirements, including reproducibility and repeatability. It is not clear, however, what this flexibility encompasses.

9.

Under your law, is it possible to overcome a possible lack of sufficiency of disclosure by submitting a «deposit» of AI software or data? Please answer YES or NO, and you may add a brief explanation.

No.

Swiss law has no legal provision allowing a possible lack of sufficiency of disclosure to be overcome by submitting a «deposit» of AI software or data.

10.

Is the standard of sufficiency of disclosure met in the following hypothetical cases (you may answer whether sufficiency of disclosure is met by answering YES or NO, but you also may add a brief explanation)? Hereinafter, «publicly available» refers to the priority/filing date.

The standard of sufficiency of disclosure is discussed above. Besides, the EPO case law regarding AI-related inventions is still scarce but decisions start emerging, such as in ARC Seibersdorf (EPO, 12 May 2020, T 0161/18), which rejected a patent application for lack of sufficient disclosure of training data under Art. 83 EPC. In this case, the residual novelty of the claimed invention came down to using an artificial neural network (ANN) in lieu of another mathematical function. The decision first concluded that this residual novel aspect cannot support an inventive step if the alleged

technical effect of using this ANN (in the context of the claimed invention) is not convincingly described in the description and is not reflected in the claim. In addition, the ANN used was found to be insufficiently described, because the description merely refers to a general training algorithm and general types of training data, therefore the person skilled in the art could not reproduce the invention. It is important, however, to keep in mind that this conclusion was drawn in a context where the alleged technical effects were not apparent from the mere mention of a general training algorithm and general types of training data.

As another example, in decision TK Holdings (EPO, 3 March 2020, T 0509/18), the board concluded that the application did not disclose the invention (relating to ML-based driver alertness detection) in a manner sufficiently clear and complete for the skilled person to be able to carry out the claimed inferences (e.g., a «classification of the driver's attention state»).

With this in mind, a general comment to the hypothetical scenarios a) to d) below is in order: In Switzerland, the sufficiency of disclosure is normally assessed in respect of the claimed subject-matter and corresponding embodiments in the patent application documents, irrespective of the tools used to arrive at this subject-matter.

a) The specific profile of a wing or the specific composition of a drug was designed using AI, and this AI system was trained using publicly available training data.

If the claims are directed to, for instance, a wing or a drug, then this wing or the specific composition of the drug must be sufficiently described as such, together with its fabrication process, if necessary, to enable a skilled person to reproduce the claimed invention. Whether the wing was designed using computer-aided design or AI is of little importance. Similarly, it is irrelevant that a drug composition has been achieved using ab initio tools, AI, or books.

If, by contrast, the claims are directed to an AI-assisted method, then this method must be sufficiently described as such, keeping in mind the decisions ARC Seibersdorf (T 0161/18) and TK Holdings (T 0509/18).

b) The specific profile of a wing or the specific composition of a drug was designed using AI, and this AI system was trained using not publicly available training data.

See answer to Question 10.a).

c) The invention consists of a new or improved AI, and the AI platform or environment (which may involve extensive databases) in which the invention is operating is publicly available on a website.

If the invention claimed is primarily directed to a new/improved AI (be it as a computer-implemented method, a computerized system, and/or a computer program product), then the AI framework must be sufficiently

1 European Patent Office Report of the IP5 expert round table on artificial intelligence, Munich, 31 October 2018.

described to allow the skilled person to implement the new/improved AI, including the cognitive algorithm and data (or type of data) used to train it and perform inferences. In particular, the residual novel parts of the claimed invention must be sufficiently described. That the AI platform or environment is publicly available may be helpful to strengthen the sufficiency but is not required, *a priori*. This, however, may adversely impact the novelty and the inventive step.

- d) **The invention consists of a new or improved AI, and the AI platform or environment (which may involve extensive databases) in which the invention is operating is not publicly available.**

See answer to Question 10.c).

IV. Policy considerations and proposals for improvements of your Group's current law

Inventiveness

11.

According to the opinion of your Group, is your current law regarding inventiveness of AI inventions adequate and/or sufficient? Please answer YES or NO, and you may add a brief explanation.

Yes.

Most AI-related inventions concern software implemented on classic computers, as opposed to hardware-implemented AI (e.g., crossbar array structures for performing synaptic interconnect operations). Hardware-implemented AI does not pose particular patentability issues. Concerning software-based AI inventions, this Group considers that such inventions do not fundamentally differ from other computerized techniques, at least as far as intellectual property protection is concerned.

In Switzerland, the existing patent law is formulated in a technology-neutral manner and has proven to be sufficiently flexible to reasonably address inventiveness of inventions in any field of technology, including computer-implemented inventions. This Group therefore does not currently believe that developments in the field of AI requires a change to the existing law.

12.

According to the opinion of your Group, would a differentiation between an invention made by a human being using AI technology and inventions made autonomous by an AI regarding the assessment of Inventive Step conflict with the purpose of patent law to incentivize creation (you may also refer to other general patent law doctrines under your law, if applicable)? In answering this question, please specifically refer to the scenario that a specific invention could have been made using AI without Inventive Step, but the patent applicant claims that the invention was made without using AI. Please briefly explain.

Currently, whether an AI system is capable of «autonomously inventing» is questionable, inasmuch as an invention is a technical (or technological) solution to a technical (or technological) problem. Making an invention therefore requires identifying a problem (which machines cannot do without human inputs) and recognizing a sound solution to this problem (which typically involves human inputs, too). Furthermore, an innovation made fully autonomously by an AI system (assuming such a thing exists) would likely not qualify as an invention according to the REPORT OF THE SWISS GROUP, *Inventorship of Inventions Made Using Artificial Intelligence* (Q 272), sic! 2020, 583. Moreover, it is difficult to delineate what «a specific invention [that] could have been made using AI without Inventive Step» is. For these reasons, this Group is unable to form a clear answer to this question.

That being said, any differentiation between AI-supported inventions and AI-free inventions with respect to the assessment of inventive step may jeopardize the patent system, as applicants would be faced with a dilemma, i.e., whether to accept the differentiated treatment of AI supported inventions or to conceal AI support to avoid this differentiated treatment.

Sufficiency of disclosure

13.

According to the opinion of your Group, is your current law regarding sufficiency of disclosure of AI inventions adequate and/or sufficient? Please answer YES or NO, and you may add a brief explanation.

Yes.

See the answer to Question 11.

14.

According to the opinion of your Group, if applicable, would the recognition of the possibility to submit a «deposit» in order to overcome a possible lack of sufficiency of disclosure help to foster innovation? Please answer YES or NO, and you may add a brief explanation.

No.

Applying a specific regime to AI inventions will likely not help fostering innovation if this specific regime imposes additional conditions, especially as computer-related inventions are already subject to a stringent patentability assessment compared with other types of inventions.

V. Proposals for harmonization

Inventiveness

15.

Do you consider harmonization regarding the inventiveness of AI inventions as desirable in general? Please answer YES or NO, and you may add a brief explanation.

If YES, please respond to the following questions without regard to your Group's current law or practice. Even if NO, please address the following questions to the extent your Group considers your Group's current law or practice could be improved.

Yes.

This Group considers it important that law regarding inventiveness of AI inventions be harmonized on an international level. A lack of harmonization leads to situations where patent applications of the same family are assessed according to different standards, which penalize applicants.

16.

When assessing Inventive Step, should the law differentiate between an invention made by a human using AI technology and inventions made autonomously by an AI? In particular, assuming that a specific invention could have been made using AI without Inventive Step, should the invention still be patentable if the applicant claims that the invention was made without using AI? Please briefly explain.

No.

See answer to Question 12.a) and 12.b

17.

The following questions relate to the definition of the person skilled in the art when assessing Inventive Step of an AI Invention:

- a) What should the definition of the «person skilled in the art» be? An AI «person»? A human person? A human person having access to AI?

A human person possessed of average knowledge and ability in the field of AI.

The current definition of a person skilled in the art is believed to be adequate, i.e., the skilled person is a skilled practitioner in the relevant field of technology who is possessed of average knowledge and ability and is aware of what was common general knowledge in the art at the relevant date. In the fields of AI and ML, the skilled person may be any data scientist, computer scientist, or software engineer, typically having practical knowledge of cognitive algorithms.

- b) Should the increasing use of AI in the inventive process change the definition of the person skilled in the art? Please briefly explain.

There is no need to rework the (legal) definition of the person skilled in the art, as noted in several places above. As a matter of course, for a specific field, the definition of the competencies of the skilled person may evolve over time due to developments in this field. For example, if the use of given AI methods becomes customary in a certain technological field, the skilled person (or team of skilled persons) will be considered to have knowledge of these methods.

See also answer to Question 3.a).

- c) What kind of «skills» (e.g., access to software) should this «person» have in the specific context? Please briefly explain.

See answer to Question 3b.

- d) Should the capabilities of AI impact the assessment of the skillset of the person skilled in the art? In particular, should the capabilities of AI to process a high amount of theoretical solutions of a given problem impact the assessment of the skillset? Please briefly explain.

No.

See answer to Question 3.c).

- e) Should the law treat common general knowledge differently for AI inventions? Please answer YES or NO, and you may add a brief explanation.

No. Again, this Group fails to see any good reason to apply a specific regime to inventions made using AI.

18.

Further to questions 16 and 17, how should the Inventive Step be assessed in the following hypothetical cases (you may answer whether Inventive Step is met by answering YES or NO, but you also may add a brief explanation):

- a) A publicly available AI system is trained using publicly available training data. The trained AI system is used to make a suggestion for a technical solution based on publicly available data (e.g., the invention is in the pharmaceutical field, the AI system was trained using structural information and binding data of molecules binding to a target protein and inhibiting its physiological function. The suggestion for the technical solution is a new molecule selected from a library of molecules and predicted to bind to the target protein and inhibit its physiological function).
- b) A publicly available AI system is trained using publicly available training data. The trained AI system is used to make a suggestion for a technical solution based on *not* publicly available data (e.g. a library of molecules available only to the applicant).
- c) A publicly available AI system is trained using *not* publicly available training data (e.g., unpublished experimental results obtained by the applicant). The trained AI system is used to make a suggestion for a technical solution based on publicly available data.
- d) A *not* publicly available AI system is trained using publicly available training data. The trained AI system is used to make a suggestion for a technical solution based on publicly available data. The AI system relies on commonly used AI principles and leads to the same result as another publicly available AI system commonly used in the technical field of the invention.

- e) A publicly available AI system is trained using publicly available training data. The trained AI system is used to make a suggestion for a technical solution based on publicly available data. The AI system is *not* commonly used in the technical field of the invention.
- f) A publicly available AI system is trained using publicly available training data. The trained AI system makes a plurality of suggestions for technical solutions based on publicly available data. A human selects one of the suggestions as the most promising based on his/her experience.

Global response to (a)–(f). In line with the opinion expressed in response to Question 17.d), this Group believes that the same standard of inventive step assessment as with any other type of inventions should be used. Patent requirements should remain agnostic to the technical field.

19.

Assuming that an AI system becomes standard for solving technical problems in a certain technical field, should Patent Offices use this AI system during examination of a patent application? Please answer YES or NO, and you may add a brief explanation.

Remark: It is not fully clear from the wording of the question, whether the «use of this AI system during examination» refers to the use of this AI system as: a) a tool, or b) prior art to challenge the patentability of the invention.

- a) Patent offices should ideally have access to performant digital tools, including AI tools, be it to maintain or increase the quality of the examination. Conversely, using such digital tools should not become a substitute for critical thinking.
- b) An AI that is publicly available at the effective filing date should be considered either as prior art and/or a well-known means or technique available to the person skilled in the art, such as for routine work and experimentation normal for the field of technology.

See also the answer to Questions 2 and 5.

20.

Would it be desirable that assessment of Inventive Step be automated in Patent Offices, using standard AI systems and publicly available information in order to evaluate Inventive Step? Please answer YES or NO, and you may add a brief explanation.

No.

The examination process must be based on critical thinking and therefore be carried out by human examiners. This is all the more true as the assessment of inventive step involves establishing the (non-) obviousness of a human activity, it being noted that inventors and skilled persons are human beings (see REPORT OF THE SWISS GROUP, Inven-

torship of Inventions Made Using Artificial Intelligence (Q 272), sic! 2020, 583).

21.

Please comment on any additional issues concerning any aspect of inventiveness of AI inventions you consider relevant to this Study Question.

A fairly important issue concerning the inventiveness of AI inventions relates to the distinction between the training of cognitive algorithms and inferences performed by such algorithms. Such a distinction should ideally be reflected in the patent claims, whenever possible. Now, a common problem that applicants face is that the training phase (whereby a cognitive model learns its own parameters) often involve more inventive and technical considerations than the inference phase (whereby the trained model is run to perform predictions or classifications). In addition, the sufficiency requirements may differ as well. Therefore, conclusions drawn as to the inventive step and sufficiency of AI-related inventions may have to be nuanced, depending on whether the claimed subject-matter concerns the training phase or the inference phase.

As a further remark, there is a trade-off between sufficiency of disclosure and inventive step. The more inventive a solution, the more it is necessary to describe the residual novelty of this solution. For example, if the claimed solution involves a ML model that was trained according to unknown examples, those examples would likely have to be sufficiently described, in addition to the ML model itself.

Sufficiency of disclosure

22.

Do you consider harmonization regarding the sufficiency of disclosure of AI inventions as desirable in general? Please answer YES or NO, and you may add a brief explanation. If YES, please respond to the following questions without regard to your Group's current law or practice. Even if NO, please address the following questions to the extent your Group considers your Group's current law or practice could be improved.

Yes.

This Group considers it important that law regarding sufficiency of disclosure of AI inventions be harmonized on an international level. As with any other type of inventions, a lack of harmonization forces applicants to comply with different requirements in different jurisdictions.

23.

Should the increasing use of AI change the standard of sufficiency of disclosure? Please answer YES or NO, and you may add a brief explanation.

No.

24.

Should the law provide exceptions from the standard of sufficiency of disclosure regarding AI Inventions? Please answer YES or NO, and you may add a brief explanation.
No.

25.

Should it be possible to overcome a possible lack of sufficiency of disclosure by submitting a «deposit» of AI software or data? Please answer YES or NO, and you may add a brief explanation.
No.

The answer is negative because this Group fails to see any good reason to apply a specific regime to AI-related inventions. See also the answers to Questions 9 and 14.

26.

Should the standard of sufficiency of disclosure be met in the following hypothetical cases (you may answer whether sufficiency of disclosure is met by answering YES or NO, but you also may add a brief explanation)?

- a) The specific profile of a wing or the specific composition of a drug was designed using AI, and this AI system was trained using publicly available training data.
- b) The specific profile of a wing or the specific composition of a drug was designed using AI, and this AI system was trained using *not* publicly available training data.

c) The invention consists of a new or improved AI, and the AI platform or environment (which may involve extensive databases) in which the invention is operating is publicly available on a website.

d) The invention consists of a new or improved AI, and the AI platform or environment (which may involve extensive databases) in which the invention is operating is not publicly available.

See the answer to Question 10.

The sufficiency of disclosure should be assessed in respect of the claimed subject-matter and corresponding embodiments in the patent application documents, irrespective of the tools used to arrive at this subject-matter.

27.

Please comment on any additional issues concerning any aspect of sufficiency of disclosure of AI inventions you consider relevant to this Study Question.

See the answer to Question 21.

28.

Please indicate which industry sector views provided by in-house counsels are included in your Group's answers to Part III.

This Group includes an in-house counsel of the pharma industry, as well as former in-house counsels of companies in the fields of information technology and medical diagnostics.

Zusammenfassung

Die meisten KI-bezogenen Erfindungen betreffen Software, die auf herkömmlichen Computern implementiert ist. Dies im Gegensatz zu Hardware-implementierter KI (z.B. Crossbar-Array-Strukturen zum Ausführen synaptischer Operationen), welche keine besonderen Fragen der Patentierbarkeit aufwirft. In Bezug auf softwarebasierte KI-Erfindungen ist diese Gruppe der Meinung, dass sich solche Erfindungen nicht grundlegend von anderen computergestützten Technologien unterscheiden, zumindest im Hinblick auf das geistige Eigentum. Daher sollte die Patentierbarkeit von softwarebasierten KI-Erfindungen gleich beurteilt werden, wie die Patentierbarkeit von computerimplementierten Erfindungen. Da sich das Schweizer Patentgesetz als ausreichend flexibel und technologieneutral erwiesen hat, um früheren technologischen Entwicklungen angemessen zu begegnen – so auch im Bereich der computerimplementierten Erfindungen –, sind die Autoren dieses Artikels der Ansicht, dass das Aufkommen der KI derzeit keine Änderung des bestehenden Patentrechts erfordert.

Résumé

La plupart des inventions liées à l'IA concernent des logiciels exécutés sur des ordinateurs classiques, par opposition à de l'IA utilisant du hardware dédié (par exemple, des structures crossbar pour effectuer des opérations synaptiques), qui ne pose pas de problèmes particuliers de brevetabilité. Pour ce qui concerne les inventions d'IA basées sur des logiciels classiques, ce groupe considère que ces inventions ne diffèrent pas fondamentalement des autres techniques informatisées, du moins pas en ce qui concerne la propriété intellectuelle. Ainsi, la brevetabilité de telles inventions doit être évaluée de la même manière que la brevetabilité des inventions mises en œuvre par ordinateur. La loi suisse sur les brevets d'invention s'est révélée suffisamment souple et neutre (sur le plan technologique) pour pouvoir prendre en compte les évolutions technologiques antérieures, y compris dans le domaine des inventions mises en œuvre par ordinateur. Par conséquent, l'opinion actuelle des auteurs du présent article est que l'avènement de l'IA ne nécessite pas de modification de la loi actuelle sur les brevets d'invention.