AIPPI

Study Guidelines

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2021 – Study Question

Inventiveness and sufficiency of disclosure in AI inventions

Introduction

1) This Study Question examines the issues of inventiveness and sufficiency of disclosure of inventions involving Artificial Intelligence ("AI"). For the purpose of this Study Question, an invention is deemed to involve AI, if the invention was made partially or fully by AI, and/or the invention consists of (new or improved) AI (hereinafter referred to as "AI Inventions"). AI Inventions are not limited to computer-implemented inventions, but comprise *e.g.* also the discovery of a new drug by means of AI. Reference is also made to the explanations given in the Study Guidelines and Resolution on Q272 - "Inventorship of inventions made using Artificial Intelligence" (Online, 2020).

2) Inventiveness refers to the basic concept which is laid out *e.g.* in the Resolution on Q217 - "The patentability criterion of inventive step/non-obviousness" (Hyderabad, 2017) and is reflected *e.g.* in 35 U.S. Code Section 103, Article 22.3 of the Chinese Patent Law, and Article 56 of The European Patent Convention (hereinafter referred to as "Inventive Step").

3) Sufficiency of disclosure refers to the established rule that the contents of the patent as a whole shall disclose the claimed invention in a sufficiently clear and complete manner for the person skilled in the art to be able to carry it out, as further explained in the Resolution on Q142 – "Breadth of claims, support by disclosure and scope of protection of patents" (Rio de Janeiro, 1998).

4) As of today, AI and its capability to learn from various inputs potentially outputs technical solutions which would be considered as providing an Inventive Step if made by a human being. In this respect, the question is whether or not the increasing use of AI in the inventive process does have an impact on the current standards used during the examination of the Inventive Step and, if so, how such standards would be affected by the presence of AI in the inventive process.

5) In particular, the capabilities of an "objective" human being (typically referred to as a person skilled in the art, as further explained in the Resolution on Q213 - "The person skilled in the art in the context of the inventive step requirement in patent law" (Paris, 2010)) are used as the reference point for assessing Inventive Step. Today, an AI is potentially capable of considering the total range of prior art and information. Against this

background, the question is whether, and if so how, the definition of the person skilled in the art needs to be amended, potentially resulting in the effect of raising the bar for Inventive Step.[1]

6) Further, standards of sufficiency of disclosure are set to ensure that the person skilled in the art is enabled to carry out the claimed invention based on the disclosure of the patent specification. Since the inner workings of an AI are often undisclosed or at least very difficult to comprehend, such enablement might be hampered in case of AI Inventions.[2] Thus, the question is whether it is necessary to adjust the current law regarding the sufficiency of disclosure requirement and if so, how.

Why AIPPI considers this an important area of study

7) AI is a rapidly evolving technology that finds new applications on virtually a daily basis. It has profoundly changed how problems are approached and solved in a wide variety of fields.

8) With AI gaining an increasingly important position within the inventive process it is of extraordinary relevance to scrutinize the current statutes and case law and develop ways to handle its growing importance in the future.

Previous work of AIPPI

9) The issues of inventiveness and sufficiency of disclosure of AI Inventions have not been subject matter of any dedicated AIPPI Study Question; however, the previous work of AIPPI directly and indirectly touched upon these topics multiple times.

10) In the Resolution on Q142 – "Breadth of claims, support by disclosure and scope of protection of patents" (Rio de Janeiro, 1998), AIPPI resolved, "*The contents of the patent as a whole shall disclose the claimed invention in a sufficiently clear and complete manner for the person skilled in the art to be able to carry it out.*"

Furthermore, "*There must be a fair balance between the disclosure and the breadth of claims.*"

11) Concerning selection inventions, in the Resolution on Q209 – "Selection inventions – the inventive step requirement, other patentability criteria and scope of protection" (Buenos Aires, 2009), AIPPI resolved, "*It should be possible to obtain a patent for an invention, that is a selection from a previous disclosure.*"

Furthermore, "*Selection inventions should be patentable in all technical fields.*"

In addition, "*In order to be inventive, a selection invention should display unexpected or surprising properties not apparent from the previous disclosure from which it selected in view of other prior art.*"

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[1] Cf. Ryan Abbott, Everything Is Obvious, 66 *UCLA Law Review* 2 (2019).

[2] Cf. Tabrez Y. Ebrahim, Artificial Intelligence Inventions & Patent Disclosure, 125 *Penn State Law Review* 1, 147 (165 et seq.) (2020), available at: https://ssrn.com/abstact=3722720.

12) In the Resolution on Q213 – "The person skilled in the art in the context of the inventive step requirement in patent law" (Paris, 2010), AIPPI noted, "*The person skilled in the art is a legal fiction. There should be a common approach in formulating the definition of the person skilled in the art applicable in administrative or legal proceedings that consider inventiveness in the context of the patentability of an invention or the validity of a patent.*"

Moreover, "*The person skilled in the art has at least the following characteristics:*

a) *This person possesses common general knowledge as well as knowledge in the field (or fields) to which the invention relates that the average person in that field (or fields) would be expected to have or which would be readily available to that the average person through routine searches;*

b) *This person possesses the skills that are expected from the average person in the field (or fields) to which the invention relates.*

c) *This person is able to perform routine experimentation and research and can be expected to obtain predictable solutions as compared to the prior art.*"

Additionally, "*In general, the person skilled in the art is an individual person. Depending on the technical field and the complexity of the invention, the person skilled in the art may correspond to a team of people from different disciplines, provided that would have been a common practice in the technical field of the invention at the relevant time.*"

13) In the Resolution on Q217 - "The patentability criterion of inventive step/non-obviousness" (Hyderabad, 2011), AIPPI resolved, "*There should be a common definition of inventive step/non-obviousness accepted across all jurisdictions worldwide.*"

Furthermore, "*A claimed invention shall be considered to involve an inventive step ("be non-obvious"), if, having regard to the differences between the claimed invention and the prior art, the claimed invention as a whole would not have been obvious to a person skilled in the art at the filling date or, where priority is claimed, the priority date, of the application claiming the invention.*"

Moreover, "*When evaluating inventive step/non-obviousness of the claimed invention:*

a) *the prior art should be interpreted as understood by the person skilled in the art (…)*".

In addition, "*The closeness of the technical field of the invention and the technical field of the prior art is relevant to the inventive step/non-obviousness inquiry. The nature of the invention may permit consideration of prior art in fields not as close to the invention or not as close to the other prior art references.*"

14) At the Cancun Congress in 2018, AIPPI held a double-length panel session dedicated to "Artificial Intelligence – the real IP issues" focusing on a general description of the issue of AI and its future meaning for society.

15) At the London Congress in 2019 in its Resolution on "Plausibility", AIPPI addressed the topic whether "plausibility" should be considered as a (further) patentability requirement. AIPPI resolved, "*There should be no stand-alone ground of patentability or validity based*

on plausibility. The already existing patentability (novelty, inventive step, industrial application and/or utility) or validity (e.g. sufficiency, right to priority, added matter) requirements are sufficient to ensure that the invention protected by the claims is commensurate with the technical contribution made by the specification to the state of the art."

16) To assist in gathering information about the impact of AI technologies on intellectual property law and policy, in August 2019, the USPTO published questions related to the impact of artificial intelligence inventions on patent law and policy and asked the public for written comments.[3] Those questions covered a variety of topics, including whether revisions to intellectual property protection are needed. In order to accelerate the ongoing discussion, AIPPI contributed an opinion to the questions asked by the USPTO.

17) In the Resolution on Q272 - "Inventorship of inventions made using Artificial Intelligence" (Online, 2020), AIPPI resolved: "*In order to foster innovation, inventions made using AI should not be excluded from patent protection per se, regardless of whether or not there is sufficient contribution by a natural person to be named as an inventor and provided that there is a natural or a legal person named as an applicant.*"

Scope of this Study Question

18) This Study Question shall focus on (1) possible particularities when assessing Inventive Step of AI Inventions, in particular (2) the definition of the person skilled in the art with regard to the increasing use of AI in the invention process, and (3) the examination of the current standards of sufficiency of disclosure concerning AI Inventions.

19) In contrast, the examination of the relevant prior art shall be out of scope.

20) Given the nature of AI Inventions, questions concerning the patentability of computer-implemented inventions (CII) may likely arise. However, the issue of the patentability of CIIs is out of scope, and for the purpose of answering this Study Question, patentability of CIIs is to be assumed.

Discussion

21) The first question that has to be answered is whether or not the increasing use of AI in the inventive process does have an impact on the current standards used during the examination of the Inventive Step and, if so, how such standards would be affected by the presence of AI in the inventive process.

22) In particular, it shall be examined whether, and if so how, the definition of the person skilled in the art needs to be amended.

23) On the one hand, this might be desirable as it would lead to the creation of a modern understanding that complies with real world conditions, especially as to technical progress. As mentioned above, AI is of significant importance for our future and is increasingly used in the inventive process. Therefore, it might even seem appropriate to adjust

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[3] The Questionnaire is available under: https://www.federalregister.gov/documents/2019/10/30/2019-23638/request-for-comments-on-intellectual-property-protection-for-artificial-intelligence-innovation

the definition of the person skilled in the art and make it more compatible with the ongoing/future technical developments.

24) On the other hand, an amendment of the definition of the person skilled in the art might potentially result in the effect of significantly raising the bar for Inventive Step. In a most extreme case, only AI Inventions would be able to meet the threshold of Inventive Step. Indeed, every invention made by a human being might be considered as lacking of Inventive Step due to the possible capability of AI to consider quickly and exhaustively all sorts of combinations and variations of the entire range of prior art.

25) Furthermore, the increasing importance of AI in technology might also be considered in relation to the standards of sufficiency of disclosure. The question is whether it is necessary to adjust the current law regarding the sufficiency of disclosure requirement in order to ensure that the contents of the patent as a whole shall disclose the claimed invention (on the priority/filing date) in a sufficiently clear and complete manner for the person skilled in the art to be able to carry it out, given that the inner workings of AI are often undisclosed or at least very difficult to comprehend.

26) If, for example, the specific profile of a wing or the specific composition of a drug was designed using AI, one may say that it is sufficient to disclose this specific profile of a wing or the specific composition of a drug, without disclosing the inner workings and/or raw date of the used AI in order to meet the sufficiency of disclosure requirements. In contrast, if the invention consists of a new or improved AI, one may say that the inventive elements of this AI need to be disclosed in a traditional manner in the written description, while the AI platform or environment (which may involve extensive databases) in which the invention is operating needs to be disclosed by submitting this AI platform or environment to a permanently secured disclosure platform, similar to the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure of 1977. It might be considered as an advantage of such new system that the deposit of the AI platform or environment may not need to be made on/before the priority/filing, whereas sufficiency of disclosure normally needs to be established on the priority/filing date (so that a prior public disclosure potentially endangers inventiveness - or even novelty - of the claimed invention).

27) However, such change of the current disclosure regime may result in high administrative costs and would, even more importantly, require the creation of an entirely new system. Therefore, instead of creating an amended disclosure standard/system, it might be acceptable to refer to publicly available sources, such as a website or other electronic platforms, in order to complete the disclosure of the invention (if necessary), even though these sources may not be of permanent nature.

28) Furthermore, it should be considered whether a possible amendment of the definition of the person skilled in the art (in the sense of a super-capable AI person) also impacts the issue of sufficiency of disclosure, as even a more limited disclosure might be sufficient to enable the AI skilled person to carry out the invention.

You are invited to submit a Report addressing the questions below.

Questions

I.   Current law and practice

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

<u>Inventiveness</u>

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.

2)   Further to question 1), when assessing Inventive Step, does your law differentiate between an invention made by a human being using AI technology and inventions made autonomously by AI? 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.

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.

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

   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.

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

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 <u>not</u> publicly available data (e.g. a library of molecules available only to the applicant).

c) A publicly available AI system is trained using <u>not</u> 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 <u>not</u> 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 <u>not</u> 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.

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.

<u>Sufficiency of disclosure</u>

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

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.

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.

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.

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.

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 <u>not</u> 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 <u>not</u> publicly available.

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

<u>Inventiveness</u>

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.

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.

<u>Sufficiency of disclosure</u>

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.

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.

III. Proposals for harmonization

Please consult with relevant in-house / industry members of your Group in responding to Part III.

<u>Inventiveness</u>

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.

16) When assessing Inventive Step, should the law differentiate between an invention made by a human using AI technology and inventions made autonomous 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.

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

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

   c) 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.

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

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 <u>not</u> 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 <u>not</u> 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.

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.

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.

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

<u>Sufficiency of disclosure</u>

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.

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.

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.

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.

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 <u>not</u> 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 <u>not</u> publicly available.

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

<u>General</u>

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