

Artificial Intelligence and Patent Law: future perspectives on patentability requirements 人工智能与专利法: 有关专利性要求的未来观点

1. Introduction: creative machines and Patent law 简介: 创造性机器和专利法

2. The concept of inventor 发明人的概念

- 3. Novelty Use of AI in prior art search 新颖性 将人工智能用于现有技术检索
- 4. Inventive step How to examine inventions created by (using) AI 独创性 如何审查人工智能创造的发明(以及如何使用人工智能对发明进行审查)
- 5. Conclusion 结论

- 1. Introduction: Impact of Artificial Intelligence in patent law: 3 types of issues
- 1. 简介:人工智能对专利法的影响:3类问题
- New technology and questions associated with its patentability.
 新技术以及与其可专利性相关的问题。
- Al technology is being increasingly used to grant and enforce rights. 人工智能技术越来越多地用于授予和执行权利。
- All is being used to create innovation that might be object of rights and potentially may infringe rights.

人工智能正被用来产生可能成为权利标的、且可能形成侵权的创新。

Note on terminology: for brevity reasons 'Al technologies' is not used here in a strict technical sense. Rather it will be used in a very broad and general sense and include machine learning solutions.

术语备注:为简洁起见,这里不在严格技术意义上,而是在颇为广义和普遍的层面使用"人工智能技术",其中包括机器学习解决方案。

AI creations and the rationale for Patent rights 人工智能的创造以及专利权的理由

Patents are granted to provide incentive to innovate. 授予专利旨在鼓励创新。

This rationale is linked to the notion of inventor and the economic behaviour of individuals and groups of individuals (firms/companies).

这个理由与发明人的概念以及个人和个人团体(企业/公司)的经济行为挂钩。

Accepting the notion of 'inventive machines' operating without human intervention disrupts the very foundations on which patent law is built and requires legal analysis.

接受无需人类干预而运行的"创造性机器"这一概念,会破坏专利法赖以建立的基础,因此有待法律分析。

The right to be named inventor/obligation to name the inventor is founded on the notion of attribution/personality rights and constitutes a patent moral right. Its is intrinsically linked with a number of fundamental human rights. 被认定为发明人的权利/需认定发明人的义务,建立在归属权/人格权概念的基

被认定为友明人的权利 / 需以定及明人的义务, 建立任归属权 / 人恰似概念的基础上, 构成专利的精神权利。其本质上与多项基本人权有关。

Patenting AI creations 授予人工智能的创造以专利

- 1. who is the inventor? can a non-human be an inventor? 谁是发明人? 非人类可以是发明人吗?
- Al-systems: different situations 人工智能系统:不同情况
- Intellectual abilities: Capacity to do (a part of) the work that human inventors do following instructions.

智力能力:有能力按照指令开展人类发明者所开展的(一部分)工作

• Intellectual autonomy: Capacity to work (almost) without human involvement, including determining the technical problem to be solved and the concept of the invention.

智力自主性:在(几乎)无人类参与的条件下工作的能力,包括确立需解决的技术问题和发明这一概念。

Concept of Inventor 发明人的概念

Who is the inventor of innovation created by an AI? 对于人工智能产生的创新,谁是发明人?

- 1.The AI system (National law on Legal personality) 人工智能系统(涉及有关法律人格的国内法)
- 2.The Al user (Licensing Agreement) 人工智能的用户(许可协议)
- 3.The AI owner or AI creator (National employment law; EPC rules)

人工智能的所有者或创造者(国内劳动法;欧洲专利公约细则)

Concept of Inventor: Who is the AI creator? 发明人的概念: 谁是人工智能的创造者?

- -Algorithm Architect (selects training data/identifies need for training data and algorithm that should be used, and set design specifications)
- 算法架构师 (选择训练数据、识别应使用的训练数据和算法、制定设计规范)
- -Training data collector (produces code, hardware needed to collect a data training set)
- 训练数据收集人 (产出收集数据训练集所需的代码和硬件)
- -System Implementer (puts together code developing and training data sets in order to implemented the AI solution)
- 系统执行人(将代码开发和训练数据集结合,执行人工智能解决方案)
- -Test and validation team (for the complete solution)
- 测试验证团队(面向完整解决方案)

Known issue present in new technologies that require large teams often multi-disciplinary and involving many years of research. 新技术领域中,已知问题的解决往往需要大型跨学科团队的多年研究。

Concept of Inventor 发明人的概念

New developments allow the use of automated tools for code writing (ex: Bayou project see: Murali et al 2018).

新技术进展可实现利用自动化工具编写代码(如:Bayou计划;见:Murali等的研究,2018)。

In the future 未来...

... the Al system might be able to create software for a given purpose from just a few key words, using big data analytics to find and select lines of code from multiple sources. Possibilities are endless and might lead to automated innovation.

…人工智能系统通过大数据分析,从多个信源发现、选择代码行, 也许只需几个关键词,就能生成特定用途的软件。未来存在无穷的 可能性,从而可能出现自动创新。

-creative machines: discoveries and inventions (?)

创造性机器: 发现和发明(?)

Concept of Inventor at the EPC 《欧洲专利公约》中发明人的概念

EPC Chapter II (Persons entitled to apply for and obtain a European patent – Mention of the inventor) 《欧洲专利公约》第II章(有权申请并获得欧洲专利的人 - 提及发明人)

Article 58 - Entitlement to file a European patent application 第58条 - 有权提出欧洲专利申请

A European patent application may be filed by any natural or legal person, or any body equivalent to a legal person by virtue of the law governing it. (<u>G 3/99</u>, <u>G 2/04</u>)

任何自然人或法人,以及按照准据法相当于法人的任何团体,都可提出欧洲专利申请。(G 3/99, G 2/04)

Article 60 EPC - Right to a European patent

第60条 - 取得欧洲专利的权利

The right to a patent shall belong to the inventor or his successor in title [often the employer of the inventor according to national law and/or contractual arrangements, but not necessarily] 取得欧洲专利的权利属于发明人或其权利继承人 [根据国际法律和/或契约安排,往往但不一定是发明人的雇主]

Article 62 - Right of the inventor to be mentioned 第62条 - 发明人的记载权

The inventor shall have the right, vis-à-vis the applicant for or proprietor of a European patent, to be mentioned as such before the European Patent Office.

发明人有权对欧洲专利的申请人或所有人要求在欧洲专利局作为发明人予以记载。

So who is the inventor? 那么, 谁是发明人?

Concept of Inventor 发明人的概念

Article 81 - Designation of the inventor" 第81条 - 发明人的指定

The European patent application shall designate the inventor. If the applicant is not the inventor or is not the sole inventor, the designation shall contain a statement indicating the origin of the right to the European patent.

欧洲专利申请应指定发明人。如果申请人不是发明人或不是唯一的发明人,指定中应说明取得欧洲专利的权利来源。

• Article 90 (3) and (5) 第90(3)和(5)条

The patent application will be refused if the requirement of art 81 – designation of inventor - is not fulfilled.

如果没有满足第81条(发明人的指定)的要求,则专利申请会被驳回。

• Implementing regulation Rules <u>19-21</u>, <u>41</u>, <u>60</u>, <u>143</u>, <u>144</u>, <u>163</u> 实施条例规则 <u>19</u> ~ <u>21</u>, <u>41</u>, <u>60</u>, <u>143</u>, <u>144</u>, <u>163</u>

Concept of Inventor 发明人的概念

- Rule 19 Designation of the inventor 第19条规则 发明人的指定
- (1) The request for grant of a European patent shall contain the designation of the inventor. However, if the applicant is not the inventor or is not the sole inventor, the designation shall be filed in a separate document. The designation shall state the family name, given names and full address of the inventor, contain the statement referred to in Article 81 [indicating the origin of the right to the European patent] and bear the signature of the applicant or his representative.
- (1) 在欧洲专利申请书中应指定发明人,然而,如果申请人不是发明人或不是唯一的发明人,则应在专门的文件中加以指定。该指定应包括发明人的姓名、详细地址、《公约》第81条提到的声明[说明取得欧洲专利的权利来源]及申请人或其代理人的签字。

[..]

What if an AI is designated as the inventor? 如果指定人工智能为发明人,会怎么样?

Rule 19 (2) The European Patent Office shall not verify the accuracy of the designation of the inventor.

第19(2)条规则:欧洲专利局不确认发明人指定的准确性。

- Rule 21 Rectification of the designation of an inventor 第21条规则:发明人指定的更正
- (1) An incorrect designation of an inventor shall be rectified upon request and only with the consent of the wrongly designated person and, where such a request is filed by a third party, the consent of the applicant for or proprietor of the patent.
- (1) 对发明人的错误指定,只能在提出请求并在得到被错误指定人的同意下;而且,如果是由第三方提出的请求,还必须经过欧洲专利申请人或专利权人的同意,才可以对发明人指定作出更正。
- Not done ex officio
 不能仅依职权作出更正
- Necessary the consent of the 'wrongly designated person'
 必须得到"被错误指定人"的同意
- Necessary the consent of the applicant or proprietor of the patent 必须得到专利申请人或专利权人的同意

2. The use of AI in prior Art search

2. 将人工智能用于现有技术检索

Automated tools are increasingly been used to search for prior art. 自动化工具越来越多地用于检索现有技术。

- Patent office searches and examination of novelty 专利局检索、审查新颖性
- Freedom to operate 自由实施调查
- License negotiation 许可协商
- Defensive patenting 防御性专利
- Portfolio building 专利组合构建
- Danger of increased patent thickets (?) 专利丛林愈来愈密的危害 (?)
- Danger of facilitating predatory business models based on patent assertion by non-research/practicing entities (unfair competition)

非专利研究/实施人进行专利主张的做法,会恶化掠夺性性商业模式的发展(不公平竞争)

Assessment of Novelty and AI 新颖性评价与人工智能

Article 54 EPC 《欧洲专利公约》第54条

- "(1) An invention shall be considered to be new if it does not form part of the state of the art.
- (1) 不属于现有技术的发明应认为是新发明。
- (2) The state of the art shall be held to comprise everything made available to the public by means of a written or oral description, by use, or in any other way, before the date of filing of the European patent application.
- (2) 现有技术应认为包括在欧洲专利申请日前,依书面或口头叙述的方式,依使用或任何其他方法使公众能获得的东西。
- (3) Additionally, the content of European patent applications as filed, the dates of filing of which are prior to the date referred to in paragraph 2 and which were published on or after that date, shall be considered as comprised in the state of the art.
- (3) 此外,已经提出的欧洲专利申请的内容,如其申请日是在第二款所述的日期以前,而其公开日是在该日或该日之后,应认为包括在现有技术内。

Novelty and big data analytics 新颖性与大数据分析

- 1. Use of AI tools and breach of confidentiality? 人工智能工具的使用和违反保密原则?
- 2. Was the invention disclosed? Juxtaposition vs novel use of different features 发明是否已被公开? 不同特征的并置 vs 新颖使用
- 3. Enabling disclosure, by a person skilled in the Art using normal means 使该专业的技术人员能够以正常方式进行技术交底
- 4. Mosaic prior art is not allowed in the novelty assessment so in principle, as the law stands today inventions will meet the novelty threshold.
 新颖性评估不允许现有技术的拼接,所以在原则上,按照现在的法律,发明需要满足新颖性门槛。
- 5. This approach might have to be revised in the future. 未来这一方法在也许必须修改。

Breach of confidentiality? 违反保密原则?

Article 55 (1) (a) - Non-prejudicial disclosures

第55(1)(a)条:无损害的公开

no earlier than six months preceding the filing of the European patent application and if the disclosure was due to, or in consequence of an evident abuse in relation to the applicant or his legal predecessor [..]

不早于欧洲专利申请前六个月,而且公开是由于对申请人或其法律上的前手**明显的滥用**直接或间接造成的[...]

Is the use of AI tools an evident abuse? 使用人工智能是否构成明显的滥用?

-Art 39 TRIPS on protection of undisclosed information and national law (caveat: EBA on sources of law)

《知识产权协定》第39条对未披露信息的保护以及国内法(注意: EBA关于法律渊源的规定)

- Article 4(2) Trade Secret directive unlawful means to acquire a secret 《商业秘密保护指令》第4(2)条 有关通过不合法手段获取秘密的规定
 - unauthorised access to electronic files containing or from which the secret can be deduced
 未经授权获取包含秘密或者可从中推论出秘密的电子文档
 - any other conduct which, under the circumstances, is considered contrary to honest commercial practices.

根据情况,被视为背离诚信商业做法的任何其他行为

3. Inventive Step: Article 56 EPC

3. 独创性: 《欧洲专利公约》第56条

'An invention shall be considered as involving an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art. If the state of the art also includes documents within the meaning of Article 54, paragraph 3 [earlier patent applications], these documents shall not be considered in deciding whether there has been an inventive step.

如果考虑到现有技术,一项发明对于该专业的技术人员不是显而易见的,应认为是具有创造性的发明。如果现有技术也包括第54条第3款所称的文件 [在先专利申请],这些文件在评定有无创造性时不应予考虑。

Inventive Step exam at EPO 欧洲专利局对独创性的审查

- 1.Person skilled in the art 该专业的技术人员
- 2. Methodology for assessing inventive step: 评价独创性的方法:
- a) The problem-and-solution approach "问题 解决方案"法

Step (i): Identification of closest prior art

第(i)步:识别最接近的现有技术

Step (ii): Determination of objective technical problem

第(ii)步:确定客观技术问题

Step (iii): Decision on obviousness

第(iii)步:决定是否"显而易见"

- b) Secondary indicia in the assessment of inventive step 独创性评价中的二级指标
- Overcoming a prejudice or no real expectation of success 克服了偏见,或克服了不可能成功的预期
- Unexpected technical effect 意料之外的技术功效
- Long-felt need and commercial success 长期需求和商业成功

Who is the person skilled in the art? 何谓该专业的技术人员?

➤ Ordinary practitioner aware of what is common general knowledge in the relevant field, at the priority date

知晓优先权日之前相关领域普遍知识的普通从业人员

- ➤ No inventive capability 不具备创造能力
- ➤ Has access to everything comprehended in the state of the art and the normal means and capability to perform routine work and experimentation 能够获知该领域中所有的现有技术,并且具有开展常规工作和实验的手段与能力
- ➤ May be expected to look for suggestions in neighbouring and general technical fields or even in remote technical fields, if suggested to do so.

 受建议启发,可能会在相邻或通用技术领域、甚或边远技术领域寻找建议
- ➤ However, such person would not go against common practice or against an established believe or prejudice, nor would take unpredictable risks.
 然而,该人员不会打破普遍做法或者既定信念或偏见,也不会冒无法预测的风险。
- ➤ There may be instances where it is more appropriate to think in terms of a group of persons

有些情况下,或许用上述人员组成的团队进行表述更为合适。

Inventive step and Big data/AI 创造性与大数据 / 人工智能

How to evaluate the inventive step (should the person skilled in the art be the person skilled in using AI tools or even an AI in itself?) 如何评价独创性(该专业的技术人员是否应该熟练使用人工智能工具,甚至本身就是人工智能?)

Can an AI be considered to have inventive capabilities or as a routine tool? 是否能将人工智能视为具备创造能力,或者将之视为一种常规工具?

Is the aggregation of information, probability inferences and extrapolation of conclusions inventive?

信息聚合、概率推论和结论外推,是否为创造?

- Mosaic prior is allowed for assessment of inventive step 独创性评价中允许对现有技术的拼接
- Simple juxtaposition is not inventive 简单并置不是创造

Inventive step and Big data/AI 创造性与大数据 / 人工智能

Whatever an AI machine is likely to produce when directed to a specific area (in an obvious manner) may be considered obvious.

人工智能根据指令,在具体领域(以一种显而易见的方式)产生的任何东西都可能被视为属于"显而易见"。

- But what if 但是, 如果......
 - Similar computational power is not shared by industry? 行业内不存在共享的相似计算能力?
 - Proprietary Al algorithm?人工智能算法成为专有技术?
 - Operating on proprietary data?
 在专有数据上运行?
 - Black box patenting?"黑箱"式专利授权?

Should the use of AI tools be considered for determining obviousness always or only when the invention is the result of AI intervention? 是否应始终考虑使用人工智能工具来确定"显而易见性",还是只有当发明是人工智能干预的结果时,才加以考虑?

Conclusion 结论

Al can be used both to produce innovation (subject to IPR and TS) and to enforce IPR's.

人工智能既可以用于创新的生成(受知识产权保护和技术转移的规制),也可以 用于知识产权的执行。

The answer to questions concerning AI & patentability requirements has far reaching consequences, impacting the entire cycle of innovation.

人工智能与可专利性要求相关问题的解答会形成深远影响,触及创新周期的各个环节。

From incentive to innovation to the issue of enforcement and liability for patent infringement.

由激励出发,引导创新,进而厘清专利执行和专利侵权的责任问题。

Nordberg, A., 'Artificial Intelligence innovation and Patent Law: future perspectives on patentability requirements' (forthcoming, 2020)
Nordberg, A., 《人工智能创新与专利法:有关专利性要求的未来观点》(将于2020年出版)

Comments? 敬请批评指教!



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