

## WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI)

### ISSUE 1 & 5:

#### **Incentive structure and Inventorship for AI**

Artificial Intelligence is popular for its efficiency and intelligent data mining in an age of irreversible globalization. All usage of AI whether as a convolutional neural network to screen cancer or tools such as ‘DeepText’ which drives Facebook with user-generated content, is either an invention of an AI application or an AI tool. In this context, the author intends to explain the legal predicament in attaching legal significance to ‘autonomously generated AI inventions’ by way of inventorship and/or ownership.

#### **I. Jurisprudential Development of Incentive Structure in Patent Systems for AI**

To successfully accord inventorship/ ownership to AI for the purpose of a patent application would mean entitling AI to personhood for all purposes that flow thereon such as getting into a contract, incurring liability, etc. It is evident that such rights and duties cannot be attached to AI as various studies still remain inconclusive on whether AI can really ‘think’ on its own<sup>1</sup>. However still, it becomes important to look at the ends of filing a patent application that an inventor would seek to meet. The purpose of all invention and intellectual efforts that intellectual property rights intend to protect is to incentivize the inventor. The author of this comment, shall evaluate various intellectual property theories thereby probing into the different nature of incentives that can be devised for AI in the patent system.

There are certain schools of thought that root for the personhood theory propounded by Kant and Hegel, that believe that an invention is the embodiment of the inventor’s personality and therefore, need to be recognized with some amount of legal significance<sup>2</sup>. This theory is generally guided by personal interests of the inventor. However, it is agreed that the personality of the inventor rarely manifests in his inventions as the invention generally depends on the policy pursued by the employer or on the resources available<sup>3</sup> to the inventor. The AI does not have a particular interest in the invention which it actively pursues, essential to accord personhood<sup>4</sup>.

The Utilitarian theory protects the prospects of inventions for public benefit. The benefits of a successful patent trickle down to the public as it attracts investors, leading to the commercialization of the invention<sup>5</sup>. Pursuant to this, the exclusive rights are granted for a

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<sup>1</sup> Chris Smith et al., The History of Artificial Intelligence, <https://courses.cs.washington.edu/courses/csep590/06au/projects/history-ai.pdf>

<sup>2</sup> William Fisher, Theories of Intellectual Property, <http://www.law.harvard.edu/faculty/tfisher/ipttheory.html>

<sup>3</sup> M Du Bois, Justificatory Theories for Intellectual Property Viewed through the Constitutional Prism, PER / PELJ 2018(21) - DOI <http://dx.doi.org/10.17159/1727-3781/2018/v21i0a2004> Pg. 26

<sup>4</sup> Radin 1982 Stan L Rev 959-960

<sup>5</sup> *Id.*

limited time in order to eventually carry the invention into the public domain. If a patent application is filed for an algorithm or a code generated by the AI, such an application would fail on two grounds- *first*, the lack of reproducibility; and *two*, the impossibility to regulate self-replicating AI. The issue with AI generated algorithms is the fact that the algorithm was generated as a result of certain logic fed into the system. The patent application would however disclose only the algorithm, since the logic would be protected under trade secrets<sup>6</sup>. Thus, even after the patented duration lapses, another member of the public would not be able to reproduce the same algorithm<sup>7</sup>. In the second instance, given the logics and its inherent biases, the law has minimal control over reversing any harm that an AI algorithm may generate. By virtue of their inherent qualities, the AI will autonomously replicate the bias on its various systems while simultaneously violating fundamental rights of citizens such as right against discrimination<sup>8</sup>. Such irreversible replication by AI of patented invention will raise questions on the efficacy of the patent system to combat uncertainty. Thus, it is not difficult to appreciate that the incentives that the current patent system provides to human inventors is not adequate to address AI inventions.

On the other hand, the Lockean theory of labour suggests that by virtue of initiatives of the inventor, being so committed to his work, produces the fruits of his labour through his invention<sup>9</sup>. While it fits perfectly for AI inventions, the labour theory also suggests that the patent should cease when it ‘harms’ the society as one is not able to draw upon the existing resources. It also not difficult to appreciate the lacunae in providing inventorship to the AI given the lack of desire for recognition and reputation within the AI.

An important consideration for most patent systems has been the prevalence of economic interests of the inventor over moral interests<sup>10</sup>. In other words, one will have to go no further if a case of infringement is proved. In that regard, moral interests such as integrity need not be proved, additionally<sup>11</sup>. However, to proceed in a patent infringement litigation, the inventor, who is an indispensable character in a patent infringement suit, must be competent to sue and be sued. In this instance, the AI who is supposedly the inventor must have a vested interest in the subject matter of the patent litigation. For a human inventor, the ‘vested interest’ may be characterized by reputational rise, monetary incentives. At this juncture, it becomes imperative to understand that the patent application prioritizes the invention in question over the inventor itself. Attribution of the invention to the inventor takes secondary place while proving the veracity of the information furnished in support of the invention takes primary importance<sup>12</sup>.

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<sup>6</sup> Jessica Meyers, AI and trade secrets, American Bar Association, [https://www.americanbar.org/groups/intellectual\\_property\\_law/publications/landslide/2018-19/january-february/artificial-intelligence-trade-secrets-webinar/](https://www.americanbar.org/groups/intellectual_property_law/publications/landslide/2018-19/january-february/artificial-intelligence-trade-secrets-webinar/)

<sup>7</sup> Synced, Reproducibility Challenges in Machine Learning for Health, Medium, <https://medium.com/syncedreview/reproducibility-challenges-in-machine-learning-for-health-96d5ed32fc04>

<sup>8</sup> Ed Sappin, The Rise of the (Self-Replicating) Machines, Forbes, <https://www.forbes.com/sites/forbesnyccouncil/2018/10/22/the-rise-of-the-self-replicating-machines/#1c5b6abc17b8>

<sup>9</sup> William Fisher, Theories of Intellectual Property, <http://www.law.harvard.edu/faculty/tfisher/iptheory.html>

<sup>10</sup> [https://www.jstor.org/stable/23333520?seq=12#metadata\\_info\\_tab\\_contents](https://www.jstor.org/stable/23333520?seq=12#metadata_info_tab_contents) Pg 12

<sup>11</sup> Gilliam v. ABC, <https://cyber.harvard.edu/metaschool/fisher/integrity/Links/Cases/gilliam.html>

<sup>12</sup> Fromer, Jeanne C. "EXPRESSIVE INCENTIVES IN INTELLECTUAL PROPERTY." Virginia Law Review 98, no. 8 (2012): 1745-824. [www.jstor.org/stable/23333520](http://www.jstor.org/stable/23333520)

## II. Evaluating Inventorship for AI

Ascertaining inventorship raises an important contention i.e. At what stage of the generation of an AI invention should law intervene and say that the invention is an idea<sup>13</sup> that stemmed from the AI and whether the AI has any real mind of its own to intend such an operative use of its invention. In response to the contentions, it flows obviously that the AI is no real person and therefore, by virtue of its mechanical, intelligent-self, it only analysed the logic (input) fed into it. It is thus, not difficult to appreciate that the front-end application developed by a human remains the same however, the logic changes resulting in more efficient outcomes which in some instances, had not been originally envisioned by the developer himself<sup>14</sup>. This is potentially where the issue arises as one cannot demand that an AI application not use a particular logic.

Inventorship is, in other instances, referred to the efforts of the inventor which cause it to be used in practice for its 'intended purpose'<sup>15</sup>. Even though the AI generates certain results of its own, its use is made live only after adequate testing in the non-production phase. This means that the autonomously generated AI invention does not reach its true potential or rather the invention is not 'validated'<sup>16</sup> at all till the integrating testing team, the regression team or the security team by whatever name it goes, formed of humans does not certify it to be so. Thus, a reasonable deduction would suggest that the AI does not qualify to be titled as the 'inventor' for the purposes of the invention.

As regards, co-inventorship, it requires separate identifiable contributions in the patentable invention<sup>17</sup>. The reason why AI does not make the cut to be co-inventor in an autonomously generated AI invention is the fact that the AI application or tool is developed by a human. Even though the AI may generate certain creative results of its own direction, at the end of it, it has only analysed the logic<sup>18</sup>. Thus, there is no significant contribution from the AI towards the invention itself i.e. the application or the tool. For example, a contractor devises a new way to transfer the cement to the top of the building and uses its technicians and mechanics to construct his idea however, the workers make use of their own skill and judgement and make certain alterations by which double the weight of cement as originally estimated can be carried up. In this case, the worker is the AI. With no novel contribution to the invention, the AI cannot be allowed to usurp the credit for a 'creative result' (emphasis added) born out of the invention of another i.e. the human.

## III. Alternatives to regulatory responses for AI inventions

The current incentive structure in the patent system serve purposes that do not cater to AI concerns. It treats AI as an alien element that shares no belongingness to the patent system. While it is not entirely preposterous, due to the advent of patent claims for entitling

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<sup>13</sup> Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1376 (Fed. Cir. 1986).

<sup>14</sup> Tony Bradley, Facebook AI Creates Its Own Language in Creepy Preview of Our Potential Future, Forbes (July 31, 2017), <https://www.forbes.com>.

<sup>15</sup> Solvay S.A. v. Honeywell International, 742 F.3d 998, 1000 (2014).

<sup>16</sup> Chris Smith et al., The History of Artificial Intelligence, <https://courses.cs.washington.edu/courses/csep590/06au/projects/history-ai.pdf> Pg. 13

<sup>17</sup> 3 Moler v. Purdy, 131 U.S.P.Q. 276, 279 (Pat. Off. Bd. Int. 1960).

<sup>18</sup> Angela Chen, Can an AI be an inventor? Not Yet, MIT Technology Review, (Jan.2020), <https://www.technologyreview.com/s/615020/ai-inventor-patent-dabus-intellectual-property-uk-european-patent-office-law/>

inventorship to AI, certain distinct incentives need to be developed to acknowledge the AI' intellectual effort in an invention.

The plain recognition of the AI in association to the invention is what may be permissible by law. For all the reasons recorded above, the AI is incapable of being accorded with any legal significance. However, a right of attribution can be accorded to an autonomously generated AI invention. As suggested by Jeanne C. Fromer in his article<sup>19</sup> (even though without any reference to AI), while the right of attribution is already present in patent law, it exists vis-à-vis the inventor. However, the author of this comment, suggests that there should be a right of attribution for the AI involved. The right of attribution to the inventor fades away in the corner, in light of aggressive corporate policy regarding assignment of IP which is pursued. The right of attribution for an AI which is envisioned, forms a part of a pseudo-patent application, wherein the AI involved is named. Such recognition should be conditioned on the extent of real intellectual efforts towards developing the invention itself which was not initially perceived by the inventor himself. Such a right may seem rather useless for the AI, however it can be helpful when- one, it provides traceability to the extent of liability that the human inventor may be awarded; and two, buried in the right of such attribution to AI is the repute of the human inventor involved which would not die out even after assignment thus, providing a flexible degree of control over one's creation.

The pseudo-patent application is a superficial patent application, supplementary to the main patent application. The details regarding the extent of intellectual efforts by the human inventor and the AI involved should be recorded in the pseudo-application. Since the inventor cannot manually distinguish for an AI which logic is wasteful and should be avoided, the AI sans discernment reflects the system biases thus, inflicting liability on the inventor or even the corporate assignee<sup>20</sup>. The pseudo-application will acknowledge the difference in the nature of data sets (since actual data sets cannot be revealed) fed into the AI as input and thus control or reduce the damages that inventors or owners may incur in consideration of various other factors such as mitigation measures, etc. The ethical flip-side of the pseudo-application is its ability to address the 'moral rights of traditional human inventors and the integrity of the patent system'<sup>21</sup>. By recognizing the AI' right of attribution in the invention, moral right concerns are alleviated.

Alternatively, in order to keep a check on autonomously generated AI inventions and quality control of data sets vis-à-vis constitutional mandates, a 'self-regulation code' may be developed by various corporate houses in consultation with international think-tanks and national policy makers. The Code would create a set of good practices that would be beneficial in risk and configuration management. This becomes accurately compatible with the dynamic nature of AI and its inherent quality to evolve. In this way, the AI applications or tools will have consideration for interoperability as they adapt to certain protocols or tested infrastructure. The current practice is that of setting definitive standards to understand the AI<sup>22</sup>. Definitive and

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<sup>19</sup> Fromer, Jeanne C. "Expressive incentives in Intellectual Property." *Virginia Law Review* 98, no. 8 (2012): 1745-824. [www.jstor.org/stable/23333520](http://www.jstor.org/stable/23333520)

<sup>20</sup> IBM Research, <https://www.research.ibm.com/5-in-5/ai-and-bias/>

<sup>21</sup> Ryan Abbott, The Artificial Inventor Project, *WIPO Magazine*, (Dec.2019), [https://www.wipo.int/wipo\\_magazine/en/2019/06/article\\_0002.html](https://www.wipo.int/wipo_magazine/en/2019/06/article_0002.html)

<sup>22</sup> Artificial Intelligence Standardization helps create innovation-friendly framework conditions for the technology of the future, *DIN*, (Jan. 2019),

declaratory standards run the risk of becoming obsolete and inadequate to combat unknown hindrances that AI and its inventions may create.