A MIND OF ITS OWN — DIRECT INFRINGEMENT BY USERS OF ARTIFICIAL INTELLIGENCE SYSTEMS

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ABSTRACT

 With the rise of artificial intelligence, courts must consider the legal implications of the rise of such systems. One of these implications is possible patent infringement by a system of artificial intelligence. Systems capable of creating new inventions already exist but courts have no guidance to determine liability for infringement should an artificial intelligence system infringe a patent-protected invention. For example, if Party A sells a system of artificial intelligence to Party B and the system infringes on a third party's patent, courts must determine the liable party.

 This Note provides an interim contractual solution for the issue of liability when multiple parties have involvement in a single system of artificial intelligence. The proposed solution includes contractual language to be included in a contract between the parties. For the selling party to hold the buying party harmless for infringement, the buying party must meet three requirements. First, the buying party must implement software updates provided by the selling party. Second, the buying party must notify the selling party of any known new methods created by the system of artificial intelligence. Third, the buying party must not cause infringement in bad faith. Requiring the buying party to implement the above three requirements in order to

be held harmless, ensures that the buying party does its part to limit infringement. Pursuant to these contracts, courts will only hold the selling party liable for infringement that is outside of the control of the buying party. The buying party, further, is not held liable for infringement occurring outside of its knowledge or capability to control. Providing an interim contractual solution allows the parties to have an indication of liability without relying on a court's unpredictable determination.

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INTRODUCTION

Funding for artificial intelligence startups increased "nearly sevenfold" from 2010 to 2016.[2] The term "artificial intelligence" describes "a broad set of methods, algorithms, and technologies that make software 'smart' in a way that may seem human-like to an outside observer."[3] The rise of artificial intelligence is evident in the White House's open request for information about the future of artificial intelligence in July 2016.[4] IBM published an in-depth response explaining the current capabilities of systems of artificial intelligence, the resources needed for further innovation, and how artificial intelligence can benefit society in multiple ways.[5]

The future is now. With respect to the fast-paced evolution of robotics and artificial intelligence, the industry needs guidance on addressing novel intellectual property issues never addressed by the courts. Systems of artificial

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[2] Helen Li, *Can a Computer be an Inventor?*, BILSKIBLOG (Apr. 7, 2016), http://www.bilskiblog.com/blog/2016/04/can-a-computer-be-an-inventor.html.

[3] Katherine Noyes, *5 things you need to know about A.I.: Cognitive, neural and deep, oh my!*, COMPUTERWORLD, (Mar. 3, 2016, 12:49 PM), https://www.computerworld.com/article/3040563/enterprise-applications/5-things-you-need-to-know-about-ai-cognitive-neural-and-deep-oh-my.html [http://perma.cc/7PW9-P42G] (quoting Lynne Parker, director of the division of Information and Intelligent Systems for the National Science Foundation).

[4] Request for Information on Artificial Intelligence, 81 Fed. Reg. 41610 (published June 27, 2017) https://www.federalregister.gov/documents/2016/06/27/2016-15082/request-for-information-on-artificial-intelligence [http://perma.cc/MMG2-Z85P].

[5] *See Response to – Request for Information: Preparing for the Future of Artificial Intelligence*, IBM, http://research.ibm.com/cognitive-computing/ostp/rfi-response.shtml [http://perma.cc/3YQ5-XKLH]; *See also infra* Section I.B.

intelligence have already created patentable inventions.[6]   In 2005, Jonathon Koza's system of artificial intelligence created a genetic programming invention for which Koza received a patent.[7]   Courts have not yet determined how to address ownership rights regarding intellectual property created by an artificial intelligence system, or which party might be liable should direct infringement occur.[8]

Courts have held that nonhumans cannot be considered inventors for the purpose of ownership rights to intellectual property.[9]   Although courts have discussed whether an animal may be considered an owner for purposes of intellectual property, courts have not considered such rights regarding artificial intelligence systems.[10]   Unlike animals, artificial intelligence systems work well beyond the capacity of humans.[11]   In 2011, IBM entered its artificial intelligence system, Watson, into a Jeopardy! competition

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[6] *See* Jonathon Keats*, John Koza Has Built an Invention Machine*, POPULAR SCIENCE (Apr. 18, 2006), http://www.popsci.com/scitech/article/2006-04/john-koza-has-built-invention-machine [http://perma.cc/C644-PR8R] (discussing a system of artificial intelligence that has already created a patented invention); *See also infra* Section I.C.

[7] Keats, *supra* note 6.

[8] *See generally* Ryan Abbott, *I Think, Therefore I Invent: Creative Computers and the Future of Patent Law*, 57 B.C. L. REV. 1079 (2016) (arguing that courts should consider systems of artificial intelligence to be inventors for the purpose of patent protection).

[9] *See* 35 U.S.C. § 100(f) (2016) ("The term 'inventor' means the individual….").); *See generally* Naruto v. Slater, No. 15-cv-04324-WHO, 2016 U.S. Dist. LEXIS 11041, at *10 (N.D. Cal. Jan. 28, 2016) (explaining that a nonhuman cannot act as an author for purposes of Copyright protection).

[10] *See* Naruto, *supra* note 9.

[11] *See* Jo Best, *IBM Watson: The inside story of how the Jeopardy-winning supercomputer was born and what it wants to do next*, TECHREPUBLIC, http://www.techrepublic.com/article/ibm-watson-the-inside-story-of-how-the-jeopardy-winning-supercomputer-was-born-and-what-it-wants-to-do-next/ [http://perma.cc/CE68-WJFD] (last visited Sep. 15, 2016).

against two Jeopardy! champions.[12]   Watson won the competition against both champions, proving that artificial intelligence systems, like Watson, can achieve results beyond those achievable by humans.[13]   Because of this, scholars have argued that courts should consider artificial intelligence systems as owners for purposes of patent protection.[14]   However, courts have not specifically addressed liability for direct patent infringement by a party who sells or operates systems of artificial intelligence.[15]

A single party may develop, own, operate, and provide data for a system of artificial intelligence. However, an artificial intelligence system may have multiple parties involved in various stages of development and operation.[16] Therefore, the parties, and even courts, could have difficulty determining which party is liable, should direct infringement occur. Because liability for patent infringement can have a detrimental effect on human patent owners, parties involved in systems of artificial intelligence should address liability issues before infringement occurs.

Under statutory law, only individuals can infringe on a patent.[17]   However, should a system of artificial

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[12] *Id.*

[13] *Id.*

[14] *See generally* Abbott, *supra* note 8, at 1104 (arguing, computer inventions be patentable and that its recognition would be consistent with the Constitution rationale for patent protection).

[15] Jason Lohr*, Artificial Intelligence Drives New Thinking on Patent Rights*, LEXOLOGY (July 16, 2016), http://www.lexology.com/library/detail.aspx?g=cfb71b99-e4ac-4a13-96cf-7c1fd6e98543 [HTTPS://PERMA.CC/5MWT-SB4B].

[16] *See generally Under Armour and IBM to Transform Personal Health and Fitness, Powered by IBM Watson*, IBM (Jan. 6, 2016), https://www-03.ibm.com/press/us/en/pressrelease/48764.wss [https://perma.cc/4KPE-A5BQ] (IBM partnered with Under Armour to develop an app, where IBM provides the cognitive computing technology that uses the data collected by Under Armour to provide a personalized health and fitness plan for the app user).

[17] *See* 35 U.S.C. § 100(f).

intelligence infringe on a party's patent rights, courts must determine the party or parties liable to ensure a reasonable remedy for the injured party.[18] Failing to hold a party liable for such infringements might encourage the use of systems of artificial intelligence for infringement.

Depending on the type of infringement, the liabilities of the parties may change.[19] This Note only discusses direct infringement.[20] A party directly infringes on a patent when the party "makes, uses, sells, offers to sell, or sells" a patented invention during the patent term.[21] When a party can anticipate direct infringement and formally contract to ensure its liabilities, it can take action to protect against direct infringement and avoid confusion regarding liability, should direct infringement occur.

This Note explores the potential involvement of multiple parties in a system of artificial intelligence and explores liability issues arising where the user of a system of artificial intelligence directly infringes on a patented invention. This Note also proposes sample contractual language for parties to include in order to avoid liability issues, and discusses suggestions to limit liability issues. Part I discusses the evolution of artificial intelligence, the creative thinking capabilities of artificial intelligence systems, how direct infringement by an artificial intelligence system might occur, multiple parties involved in a single artificial intelligence system, and indemnification. Part II provides   a   contractual   solution,   which   includes

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[18] *See generally* 7-20 CHISUM ON PATENTS, MONETARY RELIEF §20.03 (discussing appropriate measures of compensatory damages).
[19] *Id.*
[20] *Cf.* 35 U.S.C. § 271(b)–(c) (2016) (identifying indirect infringement, which occurs when another party induces infringement or contributes to direct infringement).
[21] 35 U.S.C. § 271(a) ("[W]hoever without authority makes, uses, offers to sell, or sells any patented invention within the United States…during the patent term…infringes the patent.").

responsibilities for each party in protecting against any potential infringement.

I.   ARTIFICIAL INTELLIGENCE AND PATENT INFRINGEMENT

The term artificial intelligence encompasses a broad range of ideas.[22] Several new forms of artificial intelligence technology, including cognitive computing, have demonstrated the ability to create new methods for performing a series of steps.[23] Direct patent infringement may occur if someone replicates a patent-protected invention without authorization from the patent owner.[24] Computational systems have creative thinking capacities, through cognitive computing, which allows a computational system to mimic human behaviors, such as thinking.[25]

A. *Examples of How Artificial Intelligence Mimics Human Behavior*

The term "artificial intelligence" describes the algorithms that make software behave in a way that appears to mimic human behavior, such as creative thinking, to an observer.[26] Merriam-Webster defines artificial intelligence as a subset of computer science that allows machines to "mimic aspects of human intelligence."[27] Multiple systems of artificial intelligence already exist and professionals in multiple fields have implemented artificial intelligence

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[22] Noyes, *supra* note 3.

[23] *See infra* Section I.B.

[24] *See* 35 U.S.C. § 271(a).

[25] *See* Noyes, *supra* note 3.

[26] *Id.*

[27] *Artificial Intelligence*, MERRIAM-WEBSTER DICTIONARY, http://www.merriam-webster.com/dictionary/artificial intelligence [HTTPS://PERMA.CC/2QMW-WCG2] (last visited September 23, 2016).

systems in different ways.[28]   Systems of artificial intelligence have already exceeded human performance.[29] IBM is a multinational technology company at the forefront of artificial intelligence design.[30] IBM's system of artificial intelligence, Watson, is one system, which has surpassed human intellectual performance.[31]   Systems similar to Watson have been implemented in several areas of technology.[32]

IBM's Watson is one of the most well-known of the artificial intelligence systems and IBM has used the system in various ways.[33]   In 2011, Watson surpassed human intellectual performance when it won a Jeopardy! competition against the two best players in Jeopardy! history.[34] To prepare for the competition, Watson played the game against 100 previous winners.[35] It answered questions related to pop culture, sports, and literature by using its extensive data bank and complex algorithms.[36] During the competition, Watson mimicked human behavior by contemplating the question, buzzing in when it had an answer, and sorted through stored information to select its best answer.[37]

In the medical field, doctors use Watson as a tool for diagnosis and for choosing a treatment plan for patients.[38] Using information from inputted data, patient notes, medical

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[28] *See Infra* Section I.A.
[29] Charles W.K. Gritton*, Will Watson Make Patents Obsolete?*, ENC, https://www.ecnmag.com/blog/2015/08/will-watson-make-patents-obsolete [http://perma.cc/CE68-WJFD] (last visited Sept. 16, 2016).
[30] *See Id.*
[31] *Id.*
[32] *See Infra* Section I.A.
[33] Best, *supra* note 11.
[34] *Id.*
[35] *Id.*
[36] *Id.*
[37] *Id.*
[38] *Id.*

journals, and more, Watson assists a doctor in multiple ways.[39]   Some medical specialists have expressed that artificial intelligence systems will have a notable impact on healthcare.[40] IBM's Watson further helped doctors discover a misdiagnosis in a cancer patient with leukemia.[41] Medical doctors have found that using artificial intelligence helps to create a more accurate diagnosis and treatment plan for patients because of the system's ability to sift through and evaluate extensive amounts of data.[42]

On March 15, 2016, two leading artificial intelligence systems, DeepMind and Google's AlphaGo, competed against an expert in a game called Go.[43]   Go is an ancient Chinese game that is associated with Chess but is considered more complex.[44]   In Chess, after the first two turns, each player has 400 possible moves.[45] In Go, after the

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[39] *Id.*

[40] *Artificial Intelligence Will Redesign Healthcare*, MEDICAL FUTURIST (Aug. 4, 2016), http://medicalfuturist.com/artificial-intelligence-will-redesign-healthcare/ [http://perma.cc/L3YJ-YB73].

[41] James Billington, *IBM's Watson Cracks Medical Mystery With Life-Saving Diagnosis for Patient Who Baffled Doctors*, INTERNATIONAL BUSINESS TIMES (Aug. 8, 2016), http://www.ibtimes.co.uk/ibms-watson-cracks-medical-mystery-life-saving-diagnosis-patient-who-baffled-doctors-1574963 [http://perma.cc/PUE3-9T9N].

[42] *See Id.*

[43] Sam Byford, *DeepMind founder Demis Hassabis on how AI will shape the future*, THE VERGE (Mar. 10, 2016, 9:50 AM), http://www.theverge.com/2016/3/10/11192774/demis-hassabis-interview-alphago-google-deepmind-ai; [http://perma.cc/QE25-RSK6]; Li, *supra*, note 2.

[44] Cade Metz, *Google's AI is About to Battle a Go Champion – But This is No Game*, WIRED (Mar. 8, 2016), https://www.wired.com/2016/03/googles-ai-taking-one-worlds-top-go-players/ [http://perma.cc/9LYR-NJ8J].

[45] Alan Levinovitz, *The Mystery of Go, the Ancient Game That Computers Still Can't Win*, WIRED (May 5, 2014), https://www.wired.com/2014/05/the-world-of-computer-go/ [http://perma.cc/H58P-BSC7]. Alan Levinovitz, *The Mystery of Go, the Ancient Game That Computers Still Can't Win*, WIRED (May 5, 2014),

first two turns, each player has nearly 130,000 possible moves.[46] Because of the extreme number of possible moves, Go is centered on the human thought process and problem solving skills, making it difficult for artificial intelligence systems to replicate a human player's moves.[47] In a victory for the technology industry, Google's system, AlphaGo won against a human expert Go player.[48] To adapt to the moves played by the opponent, AlphaGo had to mimic human behavior by observing the opposing player's movements and adjusting its strategy accordingly.[49] Due to the extreme complexity of the game, AlphaGo's victory against an expert Go player landmarks the high sophistication of current artificial intelligence systems.[50]

In addition to Google's AlphaGo, Microsoft has also created a system shown to surpass human performance.[51] Microsoft is a multinational company involved in creating state of the art computational systems including systems of artificial intelligence.[52] Microsoft's Deep Learning algorithm has surpassed human performance in identifying images.[53] In order to identify

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https://www.wired.com/2014/05/the-world-of-computer-go/. Since this article was written, Google's AlphaGo artificial intelligence system beat an expert Go player.

[46] *Id.*

[47] *See* Levinovitz, *supra* note 45.

[48] *Id.*

[49] *Id.*

[50] *See generally* Byford, *supra* note 43.

[51] *Artificial Intelligence*, MICROSOFT, https://www.microsoft.com/en-us/research/research-area/artificial-intelligence [http://perma.cc/YT3H-CQWD] (last visited Sept. 24, 2017); *Microsoft*, WIKIPEDIA, https://en.wikipedia.org/wiki/Microsoft [http://perma.cc/3VBU-3QZU] (last updated Sept. 10, 2017).

[52] *Id. See generally* Byford, *supra* note 43.

[53] Kaiming He, Xiangyu Zhang, Shaoqing Ren, & Jian Sun, *Delving Deep into Rectifiers: Surpassing Human-Level Performance on ImageNet Classification,* MICROSOFT RESEARCH, 1 (Feb. 6, 2016), https://arxiv.org/pdf/1502.01852.pdf?. [http://perma.cc/WAP4-2USN].

images, the algorithm models the problem solving behaviors of the human brain by implementing an artificial neural network.[54] Through this implementation, the system identifies an image the same way a human brain would identify and interpret an image.[55]

B. Artificial Intelligence Systems' Ability to Create

A system of artificial intelligence has already created a patentable invention.[56] John Koza's "Invention Machine" created a system that enables factories to operate more efficiently and he received patent protection for the system created by the Invention Machine.[57] Consequently, a system with the ability to create a patentable invention also has the ability to infringe on a patent-protected invention.[58] However, Koza did not disclose the Invention Machine's role in the invention and received the patent under his own name.[59] Because Koza did not disclose the Invention Machine's role in creating the invention, the United States Patent and Trademark Office ("USPTO") was not presented with whether an invention created by a system of artificial intelligence was patentable.[60]

In genetic programming, patentable invention creation and infringement have already occurred.[61] Genetic programming is a subset of software development in which programmers provide a computer with a set of information,

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[54] *See id.*

[55] *See id.*

[56] Keats*, supra* note 6.

[57] John R. Koza, *Human-Competitive Results Produced by Genetic Programming*, 11 GENETIC PROGRAMMING & EVOLVABLE MACHS. 251, 265 (2010). Keats*, supra* note 6.

[58] *See* Abbott, *supra* note 8 at 1086.

[59] Abbott, *supra* note 8, at 1087, 1088.

[60] *See* Abbott, *supra* note 7, at 1087.

[61] Koza*, supra* note 57. *See also* Abbott, *supra* note 8, at 1086.

which acts as a human gene, to imitate evolution.[62]   The human-like genes evolve and improve upon each other to create new programs.[63]   Therefore, genetic programming allows the computer to improve upon itself by editing and using its own programming. Use of genetic programming was found to have infringed or duplicated multiple inventions before 2011.[64]   One case of infringement occurred when the system worked to create a lens design and created the functionality of an optical lens patent, subsequently resulting in a finding of infringement.[65]   The system further infringed on an electrical circuit patent when it replicated the same circuit to solve a problem.[66]   If there are patent-protected inventions in the area in which the artificial intelligence is used, the system might infringe on a patent while working to create a desired solution.[67]

Systems of artificial intelligence can create software through mimicking human learning.[68]   The systems use machine learning techniques to recognize patterns, allowing a computer to learn from input data.[69]   Such systems adapt to new situations when new data is provided.[70]   Additionally, the system can learn from its own computations to continually reproduce consistent and reliable decisions.[71]   Machine learning presents itself in technologies such as Google's   self-driving   car   and   medical   diagnostic

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[62] *See* Koza, *supra* note 57.

[63] *Id.* at 252-53.

[64] *Id.* at 265.

[65] *Id.* at 271.

[66] *Id.* at 273.

[67] *See generally* Koza, *supra* note 57, at 265, 271.

[68] *See generally* Koza, *supra* note 57.

[69] *Machine Learning What it is and Why it Matters*, SAS, http://www.sas.com/en_us/insights/analytics/machine-learning.html (last visited Sept. 17, 2016).

[70] *Id.*

[71] *Id.*

technology.[72] In general terms, machine learning allows the system to alter its approach and algorithms to adapt to new and changing situations.[73]

Critics of artificial intelligence systems suggest that artificial intelligence systems take out the human factor in problem solving and provide technical solutions to problems that do not have a technical nature.[74] Many fields, however, have directly benefited from advances in artificial intelligence technology.[75] Even the White House asked for direction as to how professionals can use artificial intelligence to improve upon current practices in areas including medicine and national security.[76] Professionals have increasingly used artificial intelligence to promote the well-being and safety of society.[77]

C. *Direct Infringement of a Patented Method*

Systems of artificial intelligence can create new methods and processes in computing and data.[78] The USPTO considers methods patentable subject matter.[79] An artificial intelligence system rewrites its own programming to create new methods to solve problems.[80] An artificial

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[72] *Id.*

[73] *See generally id.*

[74] Judith Grabiner, *Partisans and Critics of a New Science: The Case of Artificial Intelligence and Some Historical Parallels*, 11 MINN. STUD. IN PHIL. & SCI. 12, 329, 330 (1988), http://mcps.umn.edu/philosophy/11_14Grabiner.pdf.

[75] *See* SAS *supra* note 69 (explaining how macine learning has been used in multiple areas of technology including healthcare, finance, and business),

[76] Request for Information, *supra* note 4.

[77] *Response to—Request for Information*, *supra* note 5.

[78] *See Response to—Request for Information*, *supra* note 5. *See Id.*

[79] 35 U.S.C. § 101 (2012); *Method (patent)*, WIKIPEDIA (last modified June 27, 2017),https://en.wikipedia.org/wiki/Method_(patent). 35 U.S.C. § 101.

[80] *See generally Machine Learning*, *supra* note 69.

intelligence system, therefore, can create a patentable invention.[81] Because such systems can create a patentable invention, it can also infringe on a patented invention.[82]

Direct infringement occurs when a party "makes, uses, sells, offers to sell, or sells any patented invention . . . during the term of the patent."[83] In a method claim, direct infringement can occur when a single entity performs each step.[84] In addition, direct infringement by multiple parties may occur in several ways.[85] Consider the party who creates an sells the artificial intelligence system a controlling party and the party who buys and uses the system an agent. Although the agent did not create the system, it may still infringe if it performs all steps of a patented method.[86] For example, consider a patented method for determining the fastest route to a destination, which considers traffic patterns, satellite data, and road conditions. Company A, the controlling company, creates and sells an artificial intelligence system to Company B, the agent. Company B directs the system to better determine the fastest route to a destination by inputting information from traffic patterns, satellite data, and road conditions. Using the inputted information, the system identifies an approach for determining the fastest route between two definitions, which happens to be the same method claimed in the patent. By performing each step in the method for determining the fastest route between two destinations, the system, under B's current control, infringed on the patent. Using the definition

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[81] *See* Keats, *supra* 5.

[82] *See* Keats, *supra* 5.

[83] 35 U.S.C. § 271(a) (2016) ("[W]hoever without authority makes, uses, offers to sell, or sells any patented invention…during the term of the patent…infringes the patent.").

[84] Akamai Techs., Inc. v. Limelight Networks, Inc., 797 F.3d 1020, 1022 (Fed. Cir. 2015) (citing BMC Res., Inc. v. Paymentech, L.P., 498 F.3d 1373, 1379-81 (Fed. Cir. 2007)).

[85] *See* Akamai, 797 F.3d at 1022-23.

[86] *Id.*at 1022.

of direct infringement, this would constitute infringement of the patent.

Second, direct infringement can occur when a party operates in a contract with another entity to perform one or more steps of a patent-protected method if all entities combined performed all steps of a patent-protected method.[87] For example, the system sold by Company A and bought by Company B is directed to develop an algorithm for determining the fastest route to a destination. Company B directs the system to perform steps one and two, which are identical to steps one and two from the patent. The system then develops the remaining steps, identical to those of the patent. Thus, Company B directing the system to develop the remaining steps would also constitute infringement under the definition of direct infringement.

In *Akamai v. Limelight*, the Federal Circuit added two additional situations in which direct infringement of method claims occurs when multiple parties are involved.[88] First, direct infringement also occurs when the entity "directs or controls others' performance" or when the parties taking action "form a joint enterprise."[89] In *Akamai*, the Federal Circuit found direct infringement even though Limelight itself did not carry out every step of a patented method.[90] Second, although Limelight's customers carried out the final method step, substantial evidence supported the jury's finding that Limelight "directed or controlled" the performance of the customers.[91] Therefore, the court attributed the infringement to Limelight, and held Limelight liable for direct infringement.[92]

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[87] Akamai, 797 F.3d at 1022-23; BMC, 498 F.3d 1373 at 1380-81.
[88] Akamai, 797 F.3d at 1022-23.
[89] *Id.* at 1022.
[90] *Id.* at 1025.
[91] *Id.* at 1024-25.
[92] *Id.* at 1025.

D. *Multi-Party Direct Infringement Using Artificial Intelligence Systems*

When multiple parties have involvement in a single artificial intelligence system, liability issues may arise if the system infringes on a patent-protected invention. One such way multiple party involvement might occur is when a party buys an artificial intelligence system from the party whom created the system. IBM has announced multiple companies that will use Watson.[93] In September 2016, IBM announced its partnership with Aerialtronics, which will use Watson's technology in commercial drones.[94] IBM added Under Armour to the list of companies who will use Watson when it announced that Under Armour would use Watson to create personalized health and fitness plans for its app users.[95] IBM announced that Weather Underground, a weather prediction company, would use Watson to forecast weather and to discover additional information about Earth's atmosphere.[96]

Through machine learning, Watson can alter its own programming.[97] Therefore, infringement and invention creation could take place, as it did in genetic programming.[98]

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[93] *See generally* IBM Watson, *supra* note 33.

[94] Marc Ferranti, *IBM's Watson IoT Hits The Skies with Aerialtronics Drone Deal*, COMPUTERWORLD, (Sept. 16, 2016, 8:23 AM), http://www.computerworld.com/article/3121224/internet-of-things/ibms-watson-iot-hits-the-skies-with-aerialtronics-drone-deal.html (Aerialtronics is a company, which produces drones).

[95] *Under Armour And IBM To Transform Personal Health and Fitness, Powered By IBM Watson*, IBM (Jan. 6, 2016), https://www-03.ibm.com/press/us/en/pressrelease/48764.wss (Under Armour is a sportswear brand that also has an app designed to promote a healthy diet and exercise).

[96] Matt Jancer, *IBM's Watson Takes On Yet Another Job, as a Weather Forecaster*, SMITHSONIAN (Aug. 26, 2016), http://www.smithsonianmag.com/innovation/ibms-watson-takes-yet-another-job-weather-forecaster-180960264/?no-ist.

[97] *See infra* Section II.B.

[98] *See infra* Section II.B.

Multiple companies may have responsibility for an artificial intelligence system at different stages.[99] Multiple parties might contribute to the development aspects of Watson, a single company might sell the system, and another party might maintain the system. Courts have not clearly addressed how to determine the liability of each party if an artificial intelligence system like Watson infringes on a patented method.

The following fictitious example demonstrates how infringement of a patent-protected method occurs. Weather Underground uses Watson to make weather predictions.[100] After multiple months of data evaluation, Watson develops a new method of weather prediction and uses the new method in its subsequent predictions.[101] Under the rule provided by the Federal Circuit in Akamai, direct infringement of a patent-protected method occurs when all of the steps are "performed or attributed to a single entity."[102] In this case, the simple performance of the new method by implementing the steps of the patent-protected method can result in liability under direct infringement.[103] Therefore, when an artificial intelligence system creates a method and implements that method to produce a result, infringement occurs if that method is patent-protected such that the system performs each and every step of the method claim.[104]

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[99] *See* Lohr, *supra* note 15.

[100] Jancer, *supra* note 96.

[101] *See generally* Jancer, *supra* note 96. This is a fictitious example using the facts of Jancer.

[102] Akamai Techs., Inc. v. Limelight Networks, Inc., 797 F.3d 1020, 1022 (Fed. Cir. 2015).

[103] *See generally* 35 U.S.C. § 271(a)-(b) (2016).

[104] In order to infringe a method, the infringer must complete all steps of the method. Adding new steps to a patent-protected method does not constitute infringement. In this example, should Watson use all of the steps of Weather Underground's invention, but add additional steps or change any step, there is no infringement.

E. Indemnification

Indemnification agreements operate to hold one party liable for damage incurred by another party.[105] Indemnification agreements come in two forms: either express or implied.[106] In express indemnification agreements, the contracts between the parties include language identifying the type of indemnification and any requirements.[107] Implied indemnification agreements do not include such language.[108] Courts interpret indemnification clauses by looking at the contract as a whole and by interpreting the language in favor of the indemnitee.[109] Therefore, the parties using an indemnification clause must construct the language to clearly identify the intentions of the parties and ensure that the clause is consistent throughout the entire contract.[110]

In *MacDonald*, the court held that including the language that the indemnitor must indemnify the indemnitee "regardless of [Indemnitee's] responsibility" sufficiently establishes the complete and sole liability of the indemnitor.[111] This language results in the court holding the indemnitee harmless regardless of the indemnitee's actions.[112]

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[105] Prince v. Pac.Gas & Elec.Co., 45 Cal. 4th 1151, 1157 (2009).

[106] *Id.*

[107] *See* MacDonald & Kruse, Inc. v. San Jose Steel Co., 29 Cal. App. 3d 413, 420 (1972). *See* Prince,,45 Cal. 4th at 1158. This discussion uses California law as a basis for discussion regarding contractual issues.

[108] *See* Prince, 45 Cal. 4th at 1158.

[109] *See generally* Prince, 45 Cal. 4th at 1158.

[110] *Id.*

[111] MacDonald*,* 29 Cal. App. 3d at 419.

[112] *Id.* This example was given in the context of active infringement. Generally, courts are reluctant to uphold indemnification provisions regarding active infringement. The scenario discussed here, does not involve active negligence, and thus, should be upheld by the court. *See also* Ira Schreger, *Negotiating and Drafting Patent Indemnification*

For courts to hold an indemnitee harmless, the clause must have "particularly clear and explicit" language.[113] The court will "strictly" construe the language for the indemnitor.[114] For the court to apply the language, the contractual language must demonstrate the intentions of the parties.[115]

II. CONTRACTUAL SOLUTIONS TO DIRECT INFRINGEMENT BY USERS OF ARTIFICIAL INTELLIGENCE

A contractual solution is needed because it provides parties with a predictable solution to liability, should infringement occur. An indemnification clause within the contract allows the parties to discuss and negotiate liability and any terms of liability before infringement occurs. For the buying party to be held harmless for any infringement, it should take responsibility to lessen the chances of direct infringement by its artificial intelligence system.

A. *Why an Interim Solution is Necessary*

Because it is unclear how courts will allocate liability when an artificial intelligence system used by multiple parties infringes a patented method, parties employing such systems should employ contractual terms to best avoid liability for direct infringement by the artificial intelligence system. Because courts have yet to provide a complete clarification rule allowing for patent attorneys to interpret

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Provisions (Oct. 6, 2011),
http://www.hipla.org/Schreger_Indemnification_Agreements.pdf
[HTTPS://PERMA.CC/D4ET-BYBD].
[113] E.L. White, Inc. v. Huntington Beach*,* 21 Cal.3d 497, 507 (1978).
[114] City of Bell v. Super. Ct., 220 Cal. App. 4th 236, 250 (Cal. Ct. App. 2013). *See also* Crawford v. Weather Shield Mfg. Inc., 44 Cal. 4th 541, 552 (2008).
[115] City of Bell*,* 220 Cal. App. 4th at 250.

when software patents are valid, contractual terms provide the best interim solution for those in the industry to use.[116] Since software forms the basis of artificial intelligence systems, it is not clear whether the inventions created by such machines would be considered patentable subject matter.[117] At this time, the uncertainty has caused a great deal of confusion among the software industry regarding when software is patentable.[118] Thus, with the uncertainty of the courts, providing an interim solution allows the parties to plan for the consequences of any direct infringement.[119]

Without an interim solution, the courts might hold a party who simply used a system of artificial intelligence, such as the operating party, liable for direct infringement, even though the operating party knew little to nothing about the possibility of infringement taking place or the risk of infringement.[120] A more permanent solution, such as amending the patent statute to include a situation where infringement occurs by an artificial intelligence system would be difficult to implement.[121] Amending the patent code in reference to infringement to include an exception would change the way the code is written, because it does not include exceptions for different types of technology.[122] A contractual solution, allows for the parties to avoid these

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[116] *See* Parker Hancock, *From State Street Bank to CLS Bank and Back: Reforming Software Patents to Promote Innovation*, 16 VAND. J. ENT. & TECH. L. 425, 429. *See generally* Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 134 S. Ct. 2347, 2355 (2014) (providing a two part test for determining patentability of software inventions).

[117] *See* Hancock, *supra* note 116, at 442.

[118] *Id.* at 455.

[119] *Id.* at 449.

[120] *See infra* Section I.C,D.

[121] *Cf.* 35 U.S.C. § 271(a) (2016) (providing situations in which direct infringement occurs without distinctions for different types of inventions).

[122] *Cf.* 35 U.S.C. § 271(a) (2016) (providing situations in which direct infringement occurs without distinctions for different types of inventions).

pitfalls absent clear guidance from the courts. This solution allows sophisticated parties to consider infringement and participate in serious negotiations and discussions pertaining to liability.

B. Indemnification Solutions

Providing a contractual solution allows parties to protect themselves against liability issues arising from direct infringement by users of systems of artificial intelligence. An indemnification solution allows the parties to take control of the liability issues that might arise without relying on a courts interpretation of the situation.[123] A party operating such a system should put in place three requirements to ensure the court holds it harmless for any infringement by the system of artificial intelligence. The requirements include: performing software updates, notifying the selling party of any new inventions and getting feedback from a patent attorney, and avoiding encouragement of infringement. Should the operating party fail to implement such requirements, the operating party would be held responsible for any direct infringement from the artificial intelligence system. By meeting the requirements, the operating party is held harmless and the liability transfers to the selling party. An operating party, may, ideally prefer indemnification without the requirements. However, to ensure just distribution of liability and allow the selling party the opportunity to continually develop the software and protect both parties from infringement liability, the operating party should enact the requirements. The operating party should take responsibility for using a machine with such vast capabilities that might cause damages to other parties.

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[123] *See* Madden, *supra* Section I (the court has not addressed patentable inventions created by systems of artificial intelligence or infringement by a system of artificial intelligence). *See generally* Lohr, s*upra* note 15.

1. Indemnification Clause Language

When an operating party and a selling party implement an indemnification clause, the operating party acts as the indemnitee and the selling party acts as the indemnitor.[124] To apply the requirements, the language from *MacDonald* will be included at the end of the proposed language below.[125]

The proposed language is:

"When [Operating Party] (1) performs all downloads to the system of artificial intelligence requested by [Selling Party] within a month of such request; (2) notifies [Selling Party] of any known new inventions created by the system of artificial intelligence; and (3) does not directly infringe on a patent-protected method in bad faith, [Selling Party] shall hold [Operating Party] harmless for any direct infringement resulting from the system of artificial intelligence regardless of [Operating Party's] responsibility for said direct infringement. Should [Operating Party] fail to adhere to the above requirements, [Selling Party] shall have no obligation to hold [Operating Party] harmless for any direct infringement by the system of artificial intelligence."[126]

To hold a party harmless without waiting for interpretation by the courts, the parties can enact a contract including an indemnification clause. The indemnification clause will hold the operating party harmless if the operating party meets the three requirements above.[127] The requirements ensure that the operating party decreases the

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[124] *See* E.L. White, Inc. v. Huntington Beach*, 21 Cal. 3d 497, 507-08 (1978) (discussing the duties of each party to an indemnification agreement).

[125] *See* Madden, *supra* Section I.E.

[126] *See* MacDonald, 29 Cal. App. 3d at 419.

[127] *See generally* MacDonald, 29 Cal. App. 3d at 413-415; Lohr, *supra* note 15.

possibility of infringement. Further, the requirements hold the selling party liable unless the operating party did not do its part to lessen the chance of infringement. The selling party is not held liable for infringement resulting from the operating party's intentional infringement or carelessness. Accordingly, courts determine the extent of the liability by looking at the contractual agreement between the parties.[128]

2. Prerequisites for Indemnity

Holding the operating party harmless, regardless of its actions, allows for the selling party to free itself of liability, even where the direct infringement occurred at the fault of the selling party.[129] Therefore, liability should only be placed on the selling party if the selling party does not implement safeguards, limiting the chances that direct infringement will occur.[130] These requirements allow the courts to hold the buying party harmless if it did not intend to contribute to the infringement, while also allowing the selling party to change the software to avoid any future infringement. The requirements hold the selling party liable for any infringement at the hands of the selling party, since it controls the software of the system of artificial intelligence.

a. Requirement 1: The Operating Party Must Download Any Software Updates Provided by the Selling Party Within a Month of Such Request.

To give the selling party a chance to fix any problems identified in the systems, the operating party must perform

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[128] Markley v. Beagle, 66 Cal. 2d 951, 961 (1967).

[129] *See* Lohr, *supra* note 15 (multiple parties may have involvement with a single system of artificial intelligence, and the direct infringement may not occur at fault of the operating or selling party).

[130] *See generally* Lohr, *supra* note 99.

any software updates provided by the selling party. Technology companies often provide regular software updates.[131]   Many people are familiar with the software updates provided by most computational systems including smartphones and computers.[132]   Sellers of these electronic devices use software updates to provide their sellers with the most updated version of firmware to provide improved electronic security and more.[133]   Sellers of systems of artificial intelligence may also use software updates to protect against direct infringement by adjusting and changing any software known to the selling company to promote infringement or to add limitations protecting against infringement.[134]

Additionally, adding this requirement also encourages the selling company to provide such software updates.[135]   Without providing such software updates, the selling company cannot continually upkeep the system to protect itself and the buying company from known avenues of direct infringement. Requiring the operating company to perform any software updates should cause the selling company to provide such updates as it makes new discoveries.

The operating party must perform any software updates at the request of the selling party in a timely manner

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[131] *See* Nicole Perlroth, *IPhone Users Urged to Update Software After Security Flaws Are Found*, N.Y. TIMES (Aug. 26, 2016), http://www.nytimes.com/2016/08/26/technology/apple-software-vulnerability-ios-patch.html?_r=1 [HTTPS://PERMA.CC/7QW2-HPQE], at B2 (showing an example of another iPhone software update and formerly entitled, *Apple Updates iOS to Patch a Security Hole Used to Spy on Dissidents*).

[132] *Id.*

[133] *Id.*

[134] *See generally* Perlroth, *supra* note 131.

[135] *Id.* (To ensure that the operating party actively attempts to reduce infringement by following the above requirements, the software company should issue monthly software updates).

to ensure that the operating party upholds its duty to the selling party to maintain the system and ensure the least possibility of infringement. Further, it allows the operating party sufficient time to perform necessary updates. Because of the one-month requirement, the selling party may provide convenient monthly updates for the operating party to perform. A one-month requirement allows the operating party to make a habit of updating the software regularly and also makes it easy for the operating party to keep track of when the updates must take place.

b. Requirement 2: The Operating Party Must Inform the Selling Party of Any Known New Inventions by the System of Artificial Intelligence.

To ensure the best protection against any infringement, the selling companies should learn of any new known inventions created by its system of artificial intelligence. When the selling party learns of any new invention, it might identify ways in which the software might become prone to infringement by identifying the way the new method was created. To avoid liability, the operating party must inform the selling party of any new inventions and must consult with an attorney to determine whether the new invention infringes on any patented inventions.[136] This requirement holds the operating party liable if it knew, or reasonably should have known, of any new inventions, and either intentionally or negligently fails to inform the selling party or fails to ensure that the invention is not patented.[137]

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[136] If an invention was created by an artificial intelligence system before the invention was patented by another party, and the patent owner later discovers the invention, the selling party nor buying company would be liable for infringement because it occurred before the owner received a patent.

[137] *See* Madden, *supra* Section II.B (discussing how infringement might occur).

Additionally, this requirement also holds the operating party responsible for informing the selling party of any new known inventions.[138] Further, this requirement puts a small responsibility on the operating party while ensuring that the courts do not hold the operating party harmless for the selling party's faults.

As a result, the reporting requirement provides the selling party with notification of any undetected infringement issues while also allowing the selling party to have awareness of the capabilities of its technology.[139] With the knowledge of new inventions arising from the system of artificial intelligence, the selling party can provide each operating party with software updates to discourage any future infringement.[140]

c. Requirement 3: The Operating Party Must Not Directly Infringe On a Patent-Protected Invention In Bad Faith.

It would be unfair to hold the selling party liable for infringement by an operating party who might be more sophisticated and commit direct infringement in bad faith. Not all operating parties will have sophisticated understanding of the capabilities of the system of artificial intelligence. However, it is important that the more sophisticated operating parties who commit infringement in bad faith be held liable for such infringement. For the operating party to avoid liability for direct infringement by the system of artificial intelligence, the operating party

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[138] *See* Madden, *supra* Section I.D (discussing each party's involvement in a system of artificial intelligence).

[139] *See* Madden, *supra* Section I.D (discussing how multiple parties might have involvement with one system of artificial intelligence).

[140] *See* 35 U.S.C. § 271(a). Courts do not typically require that the party have knowledge of the infringement in order for direct infringement to occur. But, the operating party should not be held harmless if it had knowledge of the infringement because that constitutes an act of bad faith.

must not commit infringement in bad faith.[141] To demonstrate how this proposed language would operate in a contract between a buying party and a selling party, the following section provides several hypothetical situations and outcomes.

3. *Application of Proposed Solution*

To illustrate possible applications of the contractual solutions, the following are hypothetical situations using Watson and Weather Forecast. In each situation, IBM acts as the selling party and sells Watson to Weather Forecast, who uses Watson to predict when a storm will occur in a specific area.[142] Storm Predictor, a fictional entity, has patented a method allowing a computer to predict exactly when a storm will hit a specific area, and the patent is within the patent term.[143]

a. Buyer's Failure to Update

In one situation, IBM sends Weather Forecast a software update, but Weather Forecast fails to download the update. Later, it was found that Watson infringed on Storm Predictor's patented method of predicting when a storm will hit a specific area. Because Weather Forecast failed to uphold its duty to download any software updates within a reasonable amount of time, per Requirement 1, the courts would hold Weather Forecast liable for the infringement.

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[141] *See generally* Mark. A Lemley, *Inducing Patent Infringement*, 39 U.C. DAVIS L. REV. 225, 237-38 (2005). (This requirement is important for the operating parties that have deeper knowledge of the system of artificial intelligence).

[142] Jancer, *supra* note 96. (This example uses Watson as a weather predictor to demonstrate how the contractual language affects the liability of the parties).

[143] *See* 35 U.S.C. § 271(a) (2016).

b. Buyer's Failure to Consult

In another situation, Weather Forecast finds that Watson created a new invention. Weather Forecast informs IBM of the invention, but does not consult with a patent attorney to find whether the invention infringes upon a current patent, which it does. Because Weather Forecast did not uphold its duty per Requirement 2, the court would find it liable for the direct infringement.

c. Buyer's Bad Faith Infringement

Now, Weather Forecast has awareness of Storm Predictor's patented invention. Weather Forecast decides that it wants to find a similar method to predict oncoming storms. Weather Forecast researches the patent and uses similar data to input into Watson, which identifies patterns and make predictions. Watson identifies the method for predicting storms patented by Storm Predictor and uses it to predict future storms.[144] Because Weather Forecast infringed on the patented invention in bad faith, the court would find it liable for the direct infringement per Requirement 3.

d. Buyer's Fulfillment of Each Requirement

Here, Weather Forecast has awareness of Storm Predictor's patented invention, but does not seek to find a similar method. Weather Forecast downloads each software update provided by IBM monthly, and conducts regular checks for new methods and consults with a patent attorney about any potential infringement. In this situation, Weather Forecast has been indemnified and the court would hold IBM liable for any infringement by Watson.

For Weather Forecast to avoid infringement it would have to follow each requirement: completing any downloads for software updates, notifying IBM of any new inventions and

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[144] *See generally* 35 U.S.C. §271(a) (2016).

checking for infringement with a patent attorney, and not encourage any infringement in bad faith. Identifying these safeguards before implementing the artificial intelligence system allows the parties to allocate responsibilities to best protect against direct infringement.

III. CONCLUSION

This note provides a contractual solution for parties involved in a system of artificial intelligence to protect themselves from liability for any potential direct infringement by the system. It considers the varying sophistication of parties buying these systems, and the responsibilities of the selling parties to maintain the systems to lessen any possibility of direct infringement. Enacting the suggested contractual solution allows the parties to clearly and predictably negotiate any liability issues arising from potential direct infringement by the system while ensuring each party takes responsibility in understanding and appreciating the capabilities of artificial intelligence.