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As artificial intelligence (AI) and machine learning are integrated into an increasing number of products and services, litigation issues involving patents and trade secrets will increase. In this hoganlovells.com interview, Hogan Lovells partners Celine Crowson (Washington, D.C.), Jason Lohr (San Francisco/Silicon Valley), and Dr. Chris Mammen (San Francisco) discuss the evolution of AI and machine learning in a broad range of industries, their likely impacts on intellectual property (IP) protection, and what companies can do now to prepare for future legal issues.

To date, there hasn’t been much patent litigation or activity around AI and IP. Do you have a perspective on when it may ramp up?

Chris Mammen: From a litigation perspective, AI and machine learning are all new enough that the patents haven’t come into litigation quite yet. Broadly speaking, it takes about three years to get an application through the U.S. patent office to issuance. Then there might be a dispute brewing, waiting for the patent to issue. Otherwise it will be another year or two before you start seeing enforcement activity ramp up.

From inception of the technology to litigation can be a five-year cycle, roughly speaking. Some of the early AI stuff is clearly within that time frame. But a lot of what we’ve been seeing in terms of the newsworthy media discussions of AI in the past 18 months still has some time left to run on that clock.

What types of patent issues involving AI are concerning clients?

Celine Crowson: Sometimes when we talk to clients about AI, it seems a bit “blue sky.” They realize that all these legal issues may be coming down the road around such new technologies and there are new things they need to think about. New issues in patent law may include who is the inventor if an artificially intelligent system discovers a new innovation? Who’s liable if an artificially intelligent system makes a decision that causes monetary damage or harm? Our clients will ask — so I see the possible issues coming, but what do I do about them now?

One thing they can do about these new legal issues that are going to come about from artificial intelligence has to do with some of the licenses, joint ventures, development, and other types of
agreements that they work on every day, maybe with suppliers or other vendors or partners. They should think about spelling out, in those agreements, who will be liable or responsible for the decision-making or results they get from automated or AI systems they may be using now or in the future.

Who will own the data, information, or results that may be generated by the artificially intelligent system? Or, even if ownership of data and the like is not spelled out in an agreement, because that can be a disputed area, how will the data, results, or information being generated or discovered by the artificially intelligent system — who can use it and how will it be used? Parties to the agreements can negotiate and contract for the various authorizations in place with respect to data use.

The overall point is, in the area of intellectual property-related licensing and the day-to-day agreements that clients have with their suppliers, vendors, and other partners, there are things clients can do today to attempt to lay out in contracts how some of the future issues that may come about from AI should be handled.

**Mammen:** To add to what Celine just said about ownership of the outputs of AI as we head into ever-more complex computing, we’re starting to see AI systems that are able to engage in the act of creation, whether it’s potentially traditionally copyrightable subject matter, like art or music, or if the AI systems are solving particular problems or creating engineering solutions that might be patentable subject matter. There’s a series of questions about whether you can have a patent where the inventor is an AI system. Can you have a copyright if the author is an AI system? Who owns that?

I like to think these questions tie to the “monkey selfie” copyright dispute case from a couple of years ago, where the photographer set up his camera out in the jungle, some curious macaques were playing with it, it went off, and resulted in the photo of the macaque with that very toothy grin. Some animal rights organizations litigated on behalf of the monkey, claiming that the monkey should own the copyright to that picture. It raises the question: Do you have to have a human agent as the creator for protection?

**What types of industries need to be thinking about the legal risks associated with IP and AI?**

**Crowson:** Artificial intelligence is not just for the tech, automotive, and transportation companies. The industrials companies, energy companies, agricultural, and chemical companies are also very much getting into development and use of artificially intelligent systems.

There are artificially intelligent systems in the ocean that detect problems with underwater oil wells, for example. AI is used to match paint colors or coating compositions. It needs to be understood that automated and artificially intelligent systems are already touching and all industries. IP protection and enforcement issues may come more fully to fruition down the road,
What is the difference between machine learning and AI?

Jason Lohr: Many people think of artificial intelligence as involving a cognitive aspect, where a computer can essentially think about the best way to solve a problem or perform a task based on what it has learned. And that is where we’re headed. But the state of the art now — whether you say this is a subset of artificial intelligence or a step on the way to true artificial intelligence — is what is referred to as machine learning.

Machine learning generally involves a large set of training data. For example, if a machine is to be trained to recognize different types of objects, a machine learning model or neural network might be trained using thousands of images of different types of objects, often where those objects are identified in the images. The machine learning model learns relationships between the images and labels in the training data, so that when a trained model receives an image that the model has not encountered before, the model can use the relationships it has learned to infer the type of object represented in the image.

Essentially, the machine learning uses what it has learned about other objects to infer information about a new object. In an automotive context, machine learning can be trained on many images indicating what people look like, what dogs look like, what cars look like. When the machine learning model then receives an image of an object near a vehicle, it can infer that the object is a person, for example, and can determine that the vehicle needs to react in a certain way.

That’s what the state of the art is: learning those relationships and then being able to infer or predict an outcome.

What are some of the infringement issues companies face when they use AI or machine learning in their products?

Lohr: One issue involves determining whether to seek patent protection or keep a machine learning innovation as a trade secret.

It used to be, you would make a watch, somebody could buy the watch, reverse-engineer it, and figure out how it worked and whether you were infringing their patent. As software has moved into the cloud, a lot of the instructions and processes that are executed are not publicly accessible. So it’s difficult to tell if there’s infringement because often all you can see is the outcome. Maybe if you’re lucky you can see the input, but you don’t really have access to what’s going on behind the scenes.

When you layer machine learning on top of that, it gets even more complicated. Right now, there’s no easy way to determine the relationships that were learned and used to make an
inference, or how a neural network makes those determinations. If you have a machine learning patent and you think somebody is infringing, there's almost no way to determine how their algorithm or machine learning works until you sue them, go for discovery, get access, get the information, and then figure it out — which can be very expensive and risky.

So you have to decide, do you file for a patent or are you willing to go through all that expense of trying to figure out if there is infringement. Some people say, well, for our machine learning applications, if it's something that nobody's going to be able to get access to, to see how we're doing it, and the only way we're going to be able to figure out how somebody else is doing it is if we sue them, let's keep that as a trade secret and spend our money elsewhere, maybe at a higher functional level. Let's consider the machine learning as a tool we can leverage as part of our process, but claim our invention in a way that relies on that as you would any other algorithm.

From a high-level perspective, what is the distinction between patents and trade secrets?

**Mammen:** A trade secret is something that is defined as information that is not public, that the owner uses efforts that are reasonable under the circumstances to keep secret, and that has independent economic value from the secret not being known.

The example that everyone uses is the secret formula for Coca-Cola. It's not something that you can reverse-engineer by boiling off a bottle of Coca-Cola. A trade secret lasts forever, as long as it's kept secret. But infringement depends on the wrongful taking of it. If you try and make your own cola drink that comes close to Coca-Cola, but you do it all on your own, then you can't be sued for infringement.

Patents, by contrast, are protected for a limited period of time. The disclosure in a patent has to enable somebody to make and use the invention. In exchange for disclosing the invention, the inventor is given the exclusive right to practice the invention for a limited period of time. During that period, it's more of a strict liability right, in that anyone who happens to wander into the space protected by a patent is then liable for infringement, regardless of whether they were copying the inventor or doing it on their own.

That's why things like artificial intelligence and similar complex technologies, which are not easy to reverse-engineer, are things that might be more amenable, as Jason suggested, to protection using trade secrets rather than patents.

**What types of information should clients include in their AI-related patents?**

**Lohr:** There was a recent case that involved a machine learning patent. It was similar to what we just talked about, where the process was you get an image and analyze it using some logic to determine what is represented in the image. The court said, that's something that humans have
been doing for years, so you need to put in more detailed information about how you’re doing that, such as the specific deep-learning algorithm you used or the way you do the training.

That gets to the point where you have to disclose the specifics and detailed implementation choices that you selected, and it can start to limit the value because there may be many different ways you can tackle a particular problem, and having to claim a specific implementation creates design around opportunities. Somebody wanting to get a patent on something like that — and this case is on appeal on the federal circuit so there’s no clear guidance on this yet as to how it’s going to turn out — but it’s looking like you have to put details in the description and claims that might be possible to design around. This basically means that, if a competitor wants to do something similar, they just make different choices — different algorithms, different ways of training, different datasets — and then they may not be infringing your patent.

With clients, there’s a lot of advice and strategy now being sought after: if we want to claim this, how do we claim it? What do we need to put in there? What do our claims and descriptions need to include so that we even have statutory subject matter that’s capable of being patented?

**Mammen:** With the black box problem of AI, the question from the perspective of inventors is, do you want to disclose how the AI goes about doing things, whereas it all happens inside the algorithm? Could you make that disclosure even if you wanted to?

But there’s a flip side to that, too, which is determining infringement. For claims in that space, the question may arise, do you have to get inside the black box and how the algorithm works and what it’s doing in order to determine whether or not there’s been infringement? The difficulties of that suggest that, even if it’s protectable as a patent, it may be that the problems with proving infringement may raise questions about the particular strategy you use for protecting the IP.

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