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Training Your Organization for the Future of IP in AI

While still in its infancy, artificial intelligence (AI) will undoubtedly play a large role in our lives. From mimicking human interactions to providing advancements in medical procedures, few technologies hold the potential to impact as many diverse fields as AI. With such potential, the market opportunities for this technology are endless. However, in the race to be the first to capture these opportunities, organizations should not forget to lay a strong foundation for protecting their intellectual property (IP), namely by filing for patent protection.

Patent offices across the globe are already gearing up to meet the rising demand. For example, Andrei Iancu, director of the U.S. Patent and Trademark Office, discussed the issue at a [recent Senate Oversight Hearing](#), the European Patent Office recently held its first [conference on patenting AI](#), and China recently revised its guidelines to be friendly to software patents, including those directed to AI.

Despite the attention AI is receiving throughout the patent community, ownership of patents in the AI space is still [dominated by large tech companies](#). The reasons being that in addition to being expensive and time-consuming, correctly drafting a patent application for AI is difficult as AI presents unique challenges not encountered in other fields.

With traditional inventions, an inventor figures out “how” to do or make something and then describes that “how” in the patent application. With AI, the inventor may collect data and select a model, but “how” the system arrives at its output (e.g., the final algorithm used) may be unknown. This problem can create a host of issues such as whether or not the patent application adequately describes the invention, and who is the actual “inventor.” While the rules vary between countries, all countries require an adequate description of the invention and most countries require a person to be the “inventor.” Providing a further hurdle is the heightened standard for patent eligibility for computer-implemented inventions, with the United States being in a particularly severe state of flux on this issue over the past few years.

So, what should organizations do? Continue to cede ground to large tech companies? Ignore the issue and risk losing patent rights to key innovations? Thankfully the answer does not necessarily need to be increased spending. Instead, organizations should aim to train their themselves to understand their needs and goals related to patent protection and intellectual property as a whole.

Patenting Strategies

Key decision makers should understand the role that patents may play in their company’s future and set goals based on that role. For example, a patenting strategy to develop a defensive patent portfolio to ward off other companies asserting their patents differs from a patenting strategy aimed at enticing investors to secure another round of funding. Likewise, a patenting strategy to prevent competitors from copying your key product will differ from a patenting strategy aimed at raising revenue through a licensing program.

Engineers and inventors should equally understand the goals of the organization and strive to innovate towards those goals. Moreover, when striving to meet those goals, engineers and inventors should understand the disclosure requirements necessary for creating a quality patent application. While the bulk of this responsibility should undoubtedly fall on the patent attorney, training engineers and inventors on the keys to patentable innovations not only leads to lower attorney costs and higher quality patent applications, but also increases the internal feedback opportunities between decision makers and inventors regarding innovation and the competitive edge of the organization.

So how should engineers and inventors be trained? To meet the challenge of identifying patentable AI innovations, engineers and inventors should be trained and taught to focus on their inputs and selections and (i) how those inputs and selections benefit a specific application (e.g., identifying heart problems in a CT scan), and (ii) how those inputs and selections are different from conventional approaches.

For innovations directed to machine learning, engineers and inventors might focus on the data selected, the model chosen, or the parameter tuning used. For example, does a particular selection of data, quality of data, or way of preparing the data, lead to unexpected optimization for your specific application? Likewise, with respect to the model chosen, does an unconventional model selection lead to an unexpected advantage for your specific application? While using a model known for sequencing is likely obvious (and thus not the basis for a patentable innovation) when used for sequencing, if that sequencing model provides an unexpected advantage when used for image recognition in medical applications, this may be the basis for a patentable innovation. Finally, with respect to parameter tuning, is there a specific combination of parameters, or a specific number of iterations, that lead to unexpected results in your specific application? If so, these may be the basis for a patentable innovation.

For innovations directed to neural networks, engineers and inventors might focus on the bias applied to a particular layer or the particular activation function. For example, applying a bias to a particular layer, a combination of layers, or a pattern of layers, that provides for an unexpected optimization may provide for the basis of a patentable invention. Likewise, a particular arrangement of layers using specific activation functions in order to compensate for the shortcomings of an individual layer's activation function in order to provide overall faster and more effective training in your application may be the basis for patentable subject matter if the claims are properly tied to that particular problem, solution, and benefit.

While not even the most advanced AI can predict the future (yet), by educating your organization on the importance of developing a patenting strategy to meet its goals, implementing and coordinating that patenting strategy on all levels of your organization, and selecting effective patent counsel to meet your needs, your organization can be trained for the future of IP in AI.

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