

Artificial Intelligence

Protecting Artificial Intelligence Inventions, Workflow and Data

Artificial Intelligence (AI) has become increasingly important to companies and institutions of all sizes and industries. AI is reshaping the business and consumer landscape – from the application of machine learning for speech recognition in the retail industry (for ordering products from smart home devices), to the application of convolutional neural networks (CNNs) for computer vision in the robotics and automobile industries (enabling autonomous driving), and the use of neural networks in the pharmaceutical industry (to identify new targets in drug discovery).

Marshall Gerstein has been filing patent applications claiming AI technologies since 2006. Between 2012 and 2017, patent application filings claiming AI technologies grew by an average of 28% per year. In 2020, we saw a 43% increase in AI patents filed for clients in industries such as insurance & financial services, information technology, process controls, and agronomics. Although AI technologies are being developed in virtually every industry, the bulk of AI filings are sectors including telecommunications, transportation, personal electronic devices and computing, life and medical sciences, security, document management, manufacturing, and engineering. Key AI technologies include machine learning, computer vision, natural language and speech processing, control methods, planning and robotics, among many others.

Marshall Gerstein regularly advises clients in protecting, maintaining, defending, enforcing, and transferring AI technologies. Our team includes attorneys, patent agents, and technical specialists, with computer and engineering degrees and backgrounds, who regularly prepare AI patent applications and assist clients in a variety of related matters, including freedom to operate opinions and licensing.

Marshall Gerstein has assisted clients with AI and intellectual property matters in a variety of technologies and technical industries, including:

- Medical devices
- Pharmaceuticals
- Chemical analysis
- Autonomous driving
- Computer vision
- E-commerce
- Natural language and speech processing
- Planning and scheduling

Overview of how AI works

AI is fundamentally a data-driven technology that takes unique datasets as input to train AI computer models. Once trained, an AI computer model may take new data as input to predict, classify, or otherwise output results for use in a variety of applications. Machine learning, arguably the most widely used AI technique, may be described as a process that uses data and algorithms to train (or teach) computer models. The trained model allows the computer to make decisions without the need for

explicit or rule-based programming. In particular, machine learning algorithms build a model on training data to identify and extract patterns from the data, and therefore acquire (or learn) unique knowledge that can be applied to new data sets.

Because of the reliance on data to train AI models, information and data sources are now an even more important and valuable resource. Companies that collect or store data (e.g., "big data"), incorporate information arising from the Internet-of-Things, or otherwise have large, unique datasets are typically well-positioned to develop or take advantage of AI technologies.

Legal aspects of AI inventions in the United States

AI inventions are generally patentable in the United States, however, because they involve computer and software-related features, care must be taken regarding the U.S. Supreme Court's subject matter eligibility test under 35 U.S.C. § 101, as provided in *Alice Corp. v. CLS Bank International*.

In general, in view of *Alice*, when considering AI inventions for patent protection, a patentee should focus on the unique technical features that may be identified in an AI-invention workflow and related components. These may include, for example:

- The pre-processing of training data (e.g., preparing unique datasets for input into a particular AI algorithm)
- The training process (e.g., improvements or adjustments to a machine-learning or neural network algorithm)
- The application of trained models (e.g., to control machines or to provide unique results)
- The hardware that executes a trained AI model, including any improvements to the hardware or its deployment in a given technical field

AI technology may also be protected by copyright, whether or not registered with the United States Copyright Office. For example, AI data that is arranged in a predetermined format to meet preprocessing concerns to train an AI model, would be subject to copyright upon being fixed in tangible form.

AI algorithms and data are entitled to state and federal protection as trade secrets. Maintaining the secrecy and restricted use of this information, however, requires a higher level of vigilance and procedures than apply to other types of confidential information.