

# Navigating § 101 rejections in artificial intelligence and machine learning patent applications

By Dohm Chankong, Esq., Todd Hopfinger, Esq., and Lestin L. Kenton Jr., Esq., Sterne, Kessler, Goldstein & Fox PLLC

July 26, 2024

## Introduction

Like the Internet revolutionized various industries in the late 1990s and early 2000s, artificial intelligence (AI) and machine learning (ML) technologies are transforming numerous sectors today.

However, similar to the challenges faced during the Internet era, patenting AI/ML innovations presents unique obstacles, especially in overcoming 35 U.S.C. § 101 rejections. AI-related patents are especially prone to these rejections due to their relationship with algorithms and computational processes, which are often viewed under the lens of abstract ideas.

This article identifies three considerations to help navigate the challenges of patenting AI and ML technologies based on recent Patent Trial and Appeal Board (PTAB) decisions. These considerations are: (1) preparing data to be used as input to an AI model, (2) utilizing an AI model in a different way, and (3) the software environment in which the AI model is implemented.

---

*AI-related patents are especially prone to rejections due to their relationship with algorithms and computational processes, which are often viewed under the lens of abstract ideas.*

---

These considerations provide a road map for successfully patenting AI and ML technologies 35 U.S.C. § 101.<sup>1</sup>

**Consideration 1: Data preparation for AI models:** The PTAB's decision in *Ex Parte Holtmann-Rice*<sup>2</sup> highlights that an improvement to a machine learning model can qualify as an improvement to the functionality of a specific machine or system. The PTAB reversed the Examiner's § 101 rejection of a method claim aimed at classification operations in a kernel-based machine learning system.

The critical language in the independent claims at issue involved an improvement to a "kernel-based machine learning classifier" through the use of using data in matrices for generating input

vectors to the machine learning classifier. The Board noted that the specification described that generating inputs in this manner enhanced the performance of a kernel-based machine learning classifier by (1) improving memory usage and (2) the accuracy of the classifier.

The Board further noted this proposed method provided an improvement to the identified problem of scaling a kernel-based machine learning models for large-scale problems such as speech recognition and computer vision.

Within this context, the Board found that the specification supported the claimed feature for the improved functioning of a kernel-based machine learning model. Under Step 2A, an improvement to software, such as a machine learning model, can be viewed as an improvement to the functionality of a machine or system.

**Consideration 2: Novel application of an AI model:** The PTAB's decision in *Ex Parte Allen*<sup>3</sup> highlights that the use of a machine learning model for processing a patient's electronic medical record (EMR) can qualify as an improvement to the functionality of a computerized clinical decision support system.

The PTAB reversed the Examiner's § 101 rejection of a claim that was directed to analyzing a patient's EMR, detecting relationships between entities across multiple sentences within the EMR using a model, and generating a medical recommendation based on the detected relationships.

The critical language in the independent claims at issue involved an improvement to a "generating, by a knowledge graph drawing component executing within the clinical decision support system, a knowledge graph using the detected entities and the hierarchical container representation, wherein generating the knowledge graph comprises for a level of the hierarchical structure" "generating, by the clinical decision support system, a treatment recommendation ... based on the knowledge graph."

Again, the Board looked to the specification, which described the improvement of using a cognitive system (e.g., a machine learning model) for parsing a patient's EMR to identify contextual relationships within the EMR and generating medical recommendations based on the identified relationships.

The Board noted the specification's identification of deficiencies in current systems, which were limited to machine learning models that were trained on manually labelled data or lexical matches within a single sentence.

The Board found that the specification provided support for the claimed features of a novel method of parsing an EMR which resulted in the improved functioning of a clinical decision system.

**Consideration 3: Environment adaptation of an AI model:** The PTAB's decision in *Ex Parte Martin*<sup>4</sup> highlights how adapting a neural network to a particular environment, like a mobile fitness tracker, can meet Step 2A. In particular, the PTAB found that the claim tied the use of a neural network to a particular data structure which reflected an improvement that allowed the neural network to operate in a mobile environment.

*As AI and machine learning continue to push the boundaries of what's possible across multiple sectors, the challenge of patenting these innovations also evolves.*

The critical language in the independent claims at issue was "a bifurcated memory structured to reduce a quantity of data subject to an artificial intelligence analysis" and "a microprocessor including a neural network, said microprocessor being configured to determine an existence of an overtraining condition based on an output of the neural network utilizing only updatable and selectively updatable data in said bifurcated memory to enable operation of the neural network in a mobile environment."

Again, the Board first looked to the specification's identification of the technological problem, which described the issues with operating a neural network on a mobile device with limited memory and processing capabilities. The Board then noted the specification's description of a bifurcated memory structure that is configured to reduce the amount of data useable by a model running on the mobile device.

While ultimately, the Board found that the Examiner did not meet his burden in addressing Appellant's arguments, the Board's identification of both the technological problem to be solved and the explicit discussion of a technological solution (i.e., the bifurcated memory) reinforces the conclusions from the *Holtmann-Rice* and *Allen* decisions — the importance of providing the problem-solution

story in the specification and linking that story to explicit features in the claim for establishing a groundwork for a technological improvement argument under Step 2A.

As AI and machine learning continue to push the boundaries of what's possible across multiple sectors, the challenge of patenting these innovations also evolves. The insights from these PTAB decisions provide a foundational roadmap for demonstrating how to integrate AI and ML claims into practical applications and how to articulate specific technological improvements.

In particular, the importance of providing detailed discussion of these improvements in the specification lays the groundwork for addressing eligibility concerns. This discussion can focus on how AI and ML innovations prepare data, apply models in novel ways, and adapt to specific software environments can significantly enhance their prospects of overcoming § 101 rejections.

The PTAB decisions in *Ex Parte Holtmann-Rice*, *Ex Parte Allen*, and *Ex Parte Martin* provide valuable guidance by emphasizing the importance of a well-articulated problem-solution narrative linked directly to claim features that substantiate technological advancements under Step 2A.

Finally, while these decisions primarily focus on Step 2A of the *Alice* analysis, the considerations outlined may also be relevant for establishing subject matter eligibility under Step 2B (inventive concept).

Specifically, the novel aspects of data preparation for a model, the application of a model in a new context, and the adaptation of the environment for the model can also support an inventive concept argument. These elements highlight unique and non-obvious arrangements that contribute to the advancement of AI and ML technologies.

Therefore, applicants should consider a multi-pronged approach when making § 101 arguments based on these considerations to strengthen their case for patentability.

#### Notes:

<sup>1</sup> It is important to note that decisions from the United States Patent and Trademark Office (USPTO), particularly those from the Patent Trial and Appeal Board (PTAB), are illustrative but not binding precedents. These decisions, however, provide valuable insights into the evolving landscape of patent eligibility and the application of judicial exceptions.

<sup>2</sup> Appeal No. 2024-000046, 2024 WL 3200050 (P.T.A.B. Mar. 27, 2024).

<sup>3</sup> Appeal No. 2022-000886, 2023 WL 2598909 (P.T.A.B. Mar. 14, 2023).

<sup>4</sup> Appeal No. 2023-001622, *opinion issued* (P.T.A.B. Aug. 25, 2023).

## About the authors



**Dohm Chankong (L)** is counsel in **Sterne, Kessler, Goldstein & Fox PLLC's** electronics practice group. He advises clients on complex patent prosecution and strategic issues and on enhancing patent portfolios with a focus on emerging technologies such as artificial intelligence and machine learning. He can be reached at [dchankong@sternekessler.com](mailto:dchankong@sternekessler.com).

**Todd Hopfinger (C)** is a director in the firm's electronics practice group. He specializes in strategic intellectual property counseling and patent prosecution for technology companies at all development stages, from

innovative startups to major global enterprises. His areas of expertise include cutting-edge fields such as AI, bioinformatics, data science, blockchain, consumer technology, advertising and cybersecurity. He can be reached at [thopfinger@sternekessler.com](mailto:thopfinger@sternekessler.com). **Lestin L. Kenton Jr. (R)** is also a director in the firm's electronics practice group. As a litigator before the Patent Trial and Appeal Board, he has led numerous inter partes review, postgrant review and covered business method review proceedings, representing both petitioners and patent owners. He can be reached at [lkenton@sternekessler.com](mailto:lkenton@sternekessler.com) The authors are based in Washington, D.C.

This article was first published on Westlaw Today on July 26, 2024.