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# Developments in the Patentability of AI Inventions and AI-Assisted Inventions

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Artificial intelligence has moved from a peripheral computational tool to a central driver of technological innovation.  Over a few short years, the AI industry has undergone rapid advancement and proliferation across virtually every field of human endeavour.  AI is now used by Fortune 500 companies, universities, and individuals to drive research and innovation related to some of the most cutting-edge issues — from drug discovery to semiconductor design, to financial modelling, and more.  AI systems serve as critical tools of discovery, and at times resemble active participants, in the inventive process itself.  This shift has forced patent law to confront questions that strain doctrines developed for a world in which invention was assumed to be exclusively human.  In 2025, those tensions came to a head.

For the past several years, the United States Patent and Trademark Office (USPTO), the Federal Circuit, and practitioners have grappled with two related, but distinct, problems: (1) whether AI-related inventions are patent-eligible under 35 U.S.C. § 101; and (2) how the Patent Act's inventorship requirements apply when AI systems materially assist in the creation of an invention that leads to a patent application.  While these issues have been percolating since the Supreme Court's modern subject-matter eligibility jurisprudence and the emergence of advanced machine-learning systems in 2022, 2025 marked a turning point in their doctrinal consolidation.

That consolidation occurred across both administrative and judicial fronts. On the administrative side, the USPTO issued multiple guidance documents in 2025 restating and refining how examiners should assess subject-matter eligibility for AI-related inventions, building on — and in some respects expanding eligibility under — the standards articulated in the Office's 2019 Revised Patent Subject Matter Eligibility Guidance and its July 2024 updates.  These materials emphasized evaluating AI inventions through the lens of concrete technological improvements, rather than treating artificial intelligence as categorically abstract.  In parallel, the USPTO rescinded and issued updated guidance related to inventorship for AI-assisted inventions, underscoring that while AI systems are substantial tools and may play a significant role in the inventive process, only humans can be inventors such that patentability continues to turn on meaningful human contribution.

On the judicial side, the Federal Circuit's decision in Recentive Analytics, Inc. v. Fox Corp. offered the first look into how the Federal Circuit may treat the subject matter eligibility of AI-related inventions, leading to some tension with subject matter eligibility guidance issued by the USPTO later in the year.  In Recentive, the court applied established Section 101 principles to claims involving the application of machine learning to new data systems and reaffirmed that reciting the use of machine learning does not, standing alone, render an invention patent-eligible — especially if the claim involves a "generic" application of machine learning to a process traditionally performed manually by humans.  At the same time, the decision clarified that AI-related inventions are not inherently abstract, and that eligibility analysis must remain grounded in what the claims actually recites as technological improvements and what it discloses to support that claim.  The case thus functions as both a constraint and a signal: a constraint on attempts to evade abstraction through AI labeling, and a signal that carefully claimed and supported AI-related inventions directed towards technological improvements can be patent eligible.

Taken together, these developments reflect an effort to stabilize patent doctrine at a moment of rapid technological change.  In some ways, rather than creating AI-specific carve-outs or

exceptions, regulators and courts in 2025 largely reaffirmed that existing statutory frameworks — § 101 eligibility, traditional inventorship principles, and long-standing claim construction doctrines—remain central to promoting AI innovation.  At the same time, the USPTO guidance issued under Director John Squires has signaled a desire to nudge evaluators to review putative applications for AI-related inventions with an eye towards driving innovation and give applicants more opportunity to prove eligibility.  The burden, however, still falls on applicants and practitioners to articulate with precision where the technological improvement lies and to document human inventive contribution with care.

This note provides a comprehensive review of the 2025 developments shaping the patentability of AI inventions and AI-assisted inventions.  Part I provides a brief background on AI, including a background on the technology and recent trends in the industry.  Part II provides a brief background of key legal doctrines in patent law pertaining to the patentability of AI and AI-assisted inventions, including subject-matter eligibility under § 101 and inventorship under the Patent Act.  Part III examines the 2025 developments related to both legal doctrines: (a) subject matter eligibility of AI inventions — including USPTO's pre-2025 and 2025 guidance and developments in the case law — and (b) the USPTO's evolving approach to inventorship for AI-assisted inventions.  Finally, Part IV considers the implications of these developments for patent prosecution, litigation strategy, and future policy debates, offering some practical insights and concluding thoughts on these developments.

# I.    Background on Artificial Intelligence

Artificial Intelligence refers to a computer technology with the ability to simulate human intelligence to learn from data to perform tasks and adapt to perform better over time and analyze large quantities of information to reach conclusions, find patterns, and predict future outcomes.  AI is not a single technology, but rather many different forms of technology that perform different functions and have different applications.  Some examples of AI models include: Natural Learning Processing (NLP), Local AI/Inferencing, Machine Learning, Artificial Neural Networks, Machine Perception, and Generative AI.  In recent years, AI technologies have undergone rapid advancement and proliferation across society and industries.

Today, Generative AI technologies driven by LLMs often receive the most coverage in publications surround AI and its applications.  In general, Generative AI refers to a type of AI model that uses unsupervised learning algorithms to generate new digital content based on large sets of data and pre-existing content — such as images, video, audio, text, and computer code — based on text prompts from a user.  Generative AI models, typically LLMs, use a process referred to as deep learning, which uses artificial neural networks with multiple layers of processing to extract progressively higher-level features from underlying datasets.  LLMs have the ability to generate conversational and plausible text responses to a wide-range of questions or prompts — they can even learn and adopt to never-before-seen-tasks with only a few examples.

Generative AI has captured headlines and dominated the cultural zeitgeist since the launch of OpenAI's ChatGPT and the release of GPT-3.5 in November 2022.[1]  When originally released, ChatGPT quickly went viral, becoming the first publicly-available AI chatbot using Generative AI to engage in fluent conversations with users and generate text responses that closely resembled human intelligence.  Since the release of ChatGPT, numerous competitors have emerged offering

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[1]  Med Kharbach, PhD, *A Timeline of The Evolution of ChatGPT* (June 27, 2024), https://www.educatorstechnology.com/2024/06/the-evolution-of-chatgpt.html.

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their own Generative AI chatbots — including Google's Gemini, Microsoft's Co-pilot, Anthropic's Claud, Meta's Meta AI, and x-AI's Grok.

Since the launch of ChatGPT, investment in AI has surged.  In 2024, private investment in AI technologies soared to $252.3 billion (up 26% from 2023), including $33.9 billion in Generative AI (up 18.7% from 2023).[2]  The United States has led in private investment in AI investment, representing in $109.1 billion of investments in AI technologies—more than 12 times higher than private investments from Chinese companies.[3]  In 2025, investments have shifted towards AI infrastructure[4] and AI end-to-end solutions that focus on integrating AI into hardware.[5]  At the same time, the AI industry has seen an unprecedented surge in investment from venture capital firms — with AI startups in the U.S. raising over $116 billion in venture capital in the first half of 2025 alone.[6]  These investments have been directed towards traditional AI companies — like OpenAI, xAI, and Anthropic — as well as companies focusing on combining AI with more traditional business-to-business services — like EliseAI, a healthcare and housing automation platform — and other companies focusing on advancing the fundamental technologies that support AI.[7]

As traditional AI-companies are building out the infrastructure for AI, a new and emerging field of Agentic AI is pushing the bounds of what people think are possible for machines.  AI Agents are autonomous AI systems powered by LLMs capable of perceiving, reasoning, acting, and learning in the pursuit of complex goals.[8]  They have shown great promise related to their ability to drive innovation.  AI Agents hold the promise of completing complex tasks autonomously with minimal user input, with developers already implementing AI agents with success in fields like software engineering and website design.[9]

AI agents also show promise for their potential application in assisting with the inventive process.  The level of involvement of AI agents in this process can vary — ranging from assistants, to research collaborators, to entirely autonomous agents.[10]  At the most basic level, AI Agents can be used for solely for labor intensive tasks, such as conducting literature review, refining hypotheses, and conducing analysis.  At a higher level, AI agents can also be used collaboratively with human users by optimizing workflows and completing certain tasks — such as data analytics, basic engineering, computation, writing, and design — while a human users oversee the

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[2]  Njenga Kariuki, Artificial Intelligence Index Report Ch. 4, 4-5, 33, 35 (2025), https://hai.stanford.edu/assets/files/hai_ai-index-report-2025_chapter4_final.pdf.

[3]  *Id.* at 4-5.

[4]  Christa Marshall & E&E News, *Here's What's in 'Stargate,' the $500-Billion Trump-Endorsed Plan to Power U.S. AI*, Scientific American (Jan. 22, 2025), https://www.scientificamerican.com/article/heres-whats-in-stargate-the-usd500-billion-trump-endorsed-plan-to-power-u-s/.

[5]  *AI Funding 2025: How Capital Is Shifting Across Data, Compute, and Robotics* (Sept. 30, 2025), https://ai2.work/startups/ai-startup-10-biggest-funding-rounds-2025/.

[6]  *Top 10 AI Startups with the Most Funding in 2025: A Comprehensive Analysis* (Nov. 21, 2025), https://www.humai.blog/top-10-ai-startups-with-the-most-funding-in-2025-a-comprehensive-analysis/.

[7]  *Id.*

[8]   Shashi Jagtap, *Agent Engineering: Orchestrating and Architecting Intelligent AI Agents*, Medium (June 10, 2025), https://medium.com/superagentic-ai/agent-engineering-orchestrating-and-architecting-intelligent-ai-agents-6cd3e71f8a5f.

[9]  *Id.*; Adrian Leow, *How AI Agents Will Disrupt Software Engineering* (April 10, 2025), https://www.gartner.com/en/articles/ai-agents-transforming-software-engineering; Design Studio UI/UX, *The Ultimate Guide to AI Web Design – Updated (2025)* (Jan. 13, 2025), https://www.designstudiouiux.com/blog/the-ultimate-guide-to-ai-web-design/#:~:text=Some%20AI%20tools%20that%20web%20designers%20can,and%20they%20require%20human%20curation%20and%20refinement.

[10]  Kamer Ali Yuksel, *How AI Agents Are Revolutionizing Scientific and Enterprise Innovation?* (April 14, 2025), https://aixplain.com/blog/ai-agents-scientific-research/#:~:text=Background%20in%20Autonomous%20Scientific%20Discovery,top%2Dtier%20venues%20like%20ICLR.

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process.[11]  Finally, AI agents can be given a general goal, but then autonomously generate, evaluate, and implement its own ideas with minimal to no user input.[12]

## II.    Legal Background

As AI technology has rapidly advanced and proliferated across industries, the law has often struggled to keep up with the pace of these advancements.  Despite proving itself to be a stable framework for over 150 years, the traditional subject-matter-eligibility analysis under Section 101 sometimes struggles with emerging technologies like AI.  At the same time, the emergence of AI agents capable of engaging in the inventive process has posed challenging questions related to inventorship.  In this section, this note provides a background of the legal doctrines related to subject-matter eligibility under 35 U.S.C. § 101 and inventorship, before turning to recent developments in the law in Part III.Bullet point

### A.    Subject Matter Eligibility under 35 U.S.C. § 101

The threshold question for patentability of AI inventions is whether it is patent eligible under Section 101 of the Patent Act.  Section 101 of the Patent Act defines the subject matter eligible for patent protection, providing:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.[13]

Section 101 permits patent protection for "new and useful processes, machines, and related improvements," subject to the Patent Act's other requirements[14] and judicially imposed exceptions. Judicially excluded from Section 101 eligibility are "laws of nature, natural phenomena, and abstract ideas," such as mathematical formulas.[15] [16]

The exception of "laws of nature, natural phenomena, and abstract ideas" from patent protection is driven by concern that permitting such a patent "would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea."[17]  That is because such concepts "are 'the basic tools of scientific and technological work.'"[18]  Providing a monopoly over these tools would risk thwarting the primary purpose of patent law of promoting discovery and invention "'by improperly typing up the future use of' these building blocks of human ingenuity."[19]

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[11]  Wang, et al., *How Do AI Agents Do Human Work? Comparing AI and Human Workflows Across Diverse Occupations*, *arXiv preprint arXiv:2510.22780*, at *2 (Oct. 26, 2025), accessible at: https://arxiv.org/abs/2510.22780.

[12]  *Id.*

[13]  35 U.S.C. 101.

[14]  *Id.* §§ 102 (novelty), 103 (non-obviousness), 112 (specification).

[15]  *Alice Corp. Pty. Ltd v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014); *see also Bilski v. Kappos*, 561 U.S. 593, 601-02 (2010) (application seeking patent for "concept of hedging risk and application of concept to energy market" not patent eligible).

[16]  The Supreme Court has interpreted Section 101 to implicitly exclude "laws of nature, natural phenomena, and abstract ideas" for over 150 years.  *Id.*; *see, e.g., O'Reilly v. Morese*, 15 How. 62, 112-120, 14 L.Ed. 601 (1854); *Le Roy v. Tatham*, 14 How. 156, 175 (1985).

[17]  *Alice*, 573 U.S. at 216 (quoting *Bilski*, 561 U.S. at 611-12).

[18]  *Id.* (quoting *Myriad Collaborative Srvs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 2116 (2012)).

[19]  *Id.* (quoting *Mayo Collaborative Srvs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 85 (2012)).

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At the same time, applying the exception too broadly risks "swallow[ing] all of patent law," given "all inventions embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas."[20] For this reason, courts recognize that sometimes "an [novel] application of a law of nature[, natural phenomena,] or mathematical formula to a known structure or process" may be patentable.[21] To qualify, the underlying law of nature, natural phenomena, or abstract idea must be applied "to a new and useful end."[22]

Under the *Alice* test, courts apply a two-step "framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications."[23] At step one, courts must "determine whether the claims at issue are directed to one of those patent-ineligible concepts."[24] To determine whether the claims are directed to a patent-ineligible concept, courts must "focus on the [patent's] claimed advance over the prior art" and evaluate whether the claim's "character as a whole" implicates excluded subject matter.[25] At step two, courts examine the elements of the claim to determine whether they, individually or collectively, "contain an 'inventive concept' sufficient to 'transform' the claimed abstract idea into a patent-eligible application."[26] To have an "inventive concept," the elements must include some "additional feature" that ensures "the process is more than a drafting effort to monopolize the" ineligible concept.[27]

Numerous Supreme Court options have addressed whether claims involving mathematical formulas and algorithms are patentable, creating key contours in the case law and USPTO guidance.

- In *Gottschalk v. Benson*, the Court held that an algorithm to convert binary-coded decimal numerals into pure binary code was not patentable as a "process," where the algorithm itself was an abstract idea and granting the patent application would "wholly pre-empt the mathematical formula."[28]

- In *Parker v. Flook*, the Court held that the prohibition on patenting abstract ideas "cannot be circumvented by attempting to limit the use of the formula to a particular technological environment" or by adding "insignificant" steps to process.[29]

- In *Diamond v. Diehr*, the Court held that an application of mathematical formula to complete particular steps of manufacturing process was patentable, where the application constituted a sufficient improvement on the existing process.[30]

- Conversely, in *Bilski v. Kappos*, the Court held that concept of hedging reduced to a mathematical formula and applied to energy markets, like algorithms in *Benson* and *Flook*, was not patentable.[31]

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[20] *Id.* (*Mayo*, 566 U.S. at 71).
[21] *Mayo*, 566 U.S. at 71 (quoting *Diamond v. Diehr* , 450 U.S. 175, 187 (1981)).
[22] *Id.* at 72 (quoting *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948)).
[23] *Alice*, 573 U.S. at 217-18 (citing *Mayo*, 566 U.S. at 78-80).
[24] *Id.*
[25] *Affinity Labs of Texas, LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1257 (Fed. Cir. 2016).
[26] *Alice*, 573 U.S. at 221-22 (quoting *Mayo*, 566 U.S. at 72-73).
[27] *Id.* at 223-24 (quoting *Mayo*, 566 U.S. at 72-73).
[28] 409 U.S. 63, 64-67, 72 (1972)
[29] 437 U.S. 584, 588-89 (1978).
[30] 450 U.S. 175, 177 (1981).
[31] 561 U.S. 593, 611-12 (2010).

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- In *Alice*, the Court held that computer system acting as third-party intermediary for settlement was not patentable, where the abstract idea of intermediated settlement already existed and simply adding a generic computer process did not improve the functioning of the computer itself or effect an improvement on any other technology.[32]

The USPTO is responsible for initially determining whether patent applications are for eligible subject-matter under the *Alice* analysis. The USPTO's guidance regarding subject-matter eligibility of abstract ideas and AI-related inventions is discussed *infra*.

## B.    Inventorship Under the Patent Act

As discussed *supra*, sophisticated AI systems and agents can be used in the inventive process, leading to new discoveries and inventions. Whether AI systems can be credited with such inventions, or human users can take credit, possess challenges under the concept of inventorship.

A patent's inventorship is fundamental to the patent law system. At bottom, it is *"whoever invents or discovers* any new and useful process, machine, manufacture, or composition of matter" that has the right to seek a patent.[33] In general, the inventors are the person that own the rights to their invention, unless the inventor assigns her rights.[34] For example, absent an agreement to the contrary, an employer does not have rights to an invention "which is the original conception of the employee."[35] An individual who invented or jointly invented one claim — meaning they "contribute[d] in some significant manner to the conception of the invention" — is considered an inventor of the patent as a whole.[36]

 The Federal Circuit is the first court to address the question of whether an AI system can be an "inventor" under the Patent Act, concluding it could not because the Patent Act defines an "inventor" as a natural person.[37] There, the applicant sought protection for two putative inventions by filing applications with the USPTO and listed "DABUS" (an AI system) as the inventor.[38] The application indicated that "the invention [was] generated by artificial intelligence," and included a "statement on DABUS' behalf."[39] The PTO denied the applications, concluding that they "lacked a valid inventor."[40] On judicial review, the Federal Circuit upheld the USPTO's determination that an AI cannot be an inventor.[41] The court reached this conclusion through its interpretation of the Patent Act, which defines "inventor" as an *"individual* or, if a joint invention, the *individuals* who invented or discovered"* the invention, which had been interpreted by the Supreme Court to be a person.[42]

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[32]   574 U.S. at 221.
[33]   35 U.S.C. § 101.
[34]   *Bd. of Trustees of Leland Standford Jr. Univ.*, 563 U.S. 776, 785 (2011) (citing *Gayler v. Wilder* , 51 U.S. (10 How. 447), 493 (1851)).
[35]   *Id.*
[36]   *Gemstar-TV Guide Int'l, Inv. C. Int'l Trade Com'n*, 383 F.3d 1352, 1381-82 (Fed. Cir. 2004).
[37]   *Thaler v. Vidal*, 43 F.4th 1207, 1210 (Fed. Cir. 2022).
[38]   *Id.* at 1209.
[39]   *Id.*
[40]   *Id.*
[41]   *Id.* at 1210-11.
[42]   *Id.* (citing 25 U.S.C. § 100(f)); *see also Mohamed v. Palestinian Auth*., 566 U.S. 49, 454 (2012) (noting that when used "[a]s a noun, 'individual' ordinarily means a human being, a person.").

The *Thaler* court left open the question of "whether inventions made by human beings with the *assistance* of AI are eligible for patent protection."[43]  The USPTO has attempted to answer that question in recent guidance, discussed *infra*.

# III.  Patentability of AI and AI-Assisted Inventions

On the patentability of AI and AI-assisted inventions, the USPTO has issued guidance on both subject-matter eligibility of AI inventions under 35 U.S.C. § 101 and inventorship of AI-assisted inventions.  The Federal Circuit has likewise offered its first ruling on subject matter eligibility of AI inventions.  Since John Squires was confirmed as Director of the USPTO in September 2025, he has signaled a shift towards providing greater patent protection to AI-related, and other emerging, technologies.  This Section discusses the recent developments in the context of existing USPTO guidance.

## A.  Subject Matter Eligibility of AI Inventions

### 1.  Pre-2025 Guidance on Subject Matter Eligibility of AI Inventions

#### (a)  February 2019 Revised Guidance

In 2019, the USPTO issued Revised Guidance that provides the basic framework for determining the patentability of AI-Inventions.  The patentability of AI-inventions, and the issues relevant to making that determination, depends upon the underlying AI technology at issue.  In general, like other computer software programs and algorithms, patent applications for AI-inventions often fall under the "abstract idea" exception to patentability under Section 101, thus requiring the application demonstrate an "inventive concept."

The USPTO recognizes AI-inventions as patentable through the designation of Class 706 in its patent classification system.  The USPTO published its Revised Patent Subject Matter Eligibility Guidance in 2019 ("2019 RPEG"), which applies to patent applications for AI-inventions, by determining whether a claim is "directed to a judicial exception (laws of nature, natural phenomena, and abstract ideas)."[44]  The 2019 RPEG clarifies the two-part *Alice* analysis that courts and examiners apply in order to improve consistency and predictability of applications.[45] While the USPTO seeks to closely follow case law, it's important to note that USPTO guidance is not binding per se and cannot supersede court decisions.[46]

Under the 2019 RPEG, examiners are directed to follow the two-step *Alice* framework.  That analysis under the guidance proceeds as follows:

- Step 1: Evaluate whether the claimed subject matter falls within the four statutory categories of patentable subject matter of a process, machine, manufacture, or composition of matter (35 U.S.C. § 101).

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[43]  *Id.* at 1213.
[44]  84 Fed. Rep. 50-01, 2019 WL 109304, at 50 (Jan. 7, 2019).
[45]  *Id.* at 52.
[46]  *Celveland Clinic Found. V. True Health Diagnostics LLC*, 760 F. App'x 1013, 1020 (Fed. Cir. 2019).

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- Step 2: Evaluate whether the claim recites a judicial exception (Prong One), and if so, whether the claim recites additional elements that integrate the exception into a practical application of the exception (Prong Two).[47]

The guidance revised Step 2A of the USPTO subject matter eligibility framework to include a "integrated into a practical application" prong. Under the revised Step 2A, Prong One asks if the claim recites an abstract idea, law of nature, or natural phenomena.[48] If not, the claim qualifies under Section 101. If it does, Prong Two asks if "the claim as whole integrates a judicial exception into a practical application."[49] The guidance directs examiners to "evaluate integration into a practical application" by (a) identifying additional elements recited by the claim, and (b) evaluating if those elements individually (or in combination) sufficiently integrate the judicial exception into a practical application.[50] The USPTO and courts consider a judicial exception to be "integrated" into a practical application if the claimed invention does something "concrete" relying on the integrated abstract idea.[51]

If the claim does not integrate a judicial exception into a practical application, examiners move onto Step 2B, which asks if the claim provides an "inventive concept."[52] A claim includes an "inventive concept"[53] if "the additional elements recited in the claims provided '*significantly more*' than the recited judicial exception (e.g., because the additional elements were unconventional in combination)."[54] [55]

Prior to 2024, the USPTO offered an example of a hypothetical patent application involving AI that would be patent eligible under the *Alice* test. The hypothetical patent application was for a computer-implemented method of training a neural network, comprised of:

(i) collecting a set of digital facial images from a database;

(ii) applying transformations to each digital facial image to create a modified set of digital facial images;

(iii) created a first training set comprised of the collected set of digital facial images, the modified set of digital facial images, and a set of digital non-facial images, and training the neural network in first stage of training;

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[47]   at 53-55.
[48]   *Id.* at 54.
[49]   *Id.* at 54-55.
[50]   *Id.* at 55.
[51]   October 2019 Patent Eligibility Guidance Update, 84 Fed. Reg. 55942, at 10-13 (Oct. 18, 2019) ("October 2019 Update"); *see also Bascom Global Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1350 (Fed. Cir. 2016).
[52]   2019 WL 109304 at 56.
[53]   Under existing standards, Generative AI model (such as an LLMs) are likely less likely to be patent eligible, requiring inventors to show models incorporate an "inventive concept." With respect to LLMs, for example, inventiveness can potentially result from: neural network configuration (types, sizes, and depts, or functions); processes for identifying optimal input data, preprocessing techniques, or training techniques that work best given the particular real work application; system architecture; input/output processes; and training. Though each arguably involves the applications of abstract ideas or mathematical formulas to computer systems, they could still be analyzed under the two-step *Alice* framework.
[54]   2019 WL 109304, at 56.
[55]   The October 2019 Update provided the following example of a computer software patent that satisfied Step 2B: an advanced computer software is used to monitor livestock via a camera feed, and separately operate a sorting gate to separate animals with aberrant behavior, that may be sufficient to constitute "significantly more" for purposes of Step 2B. October 2019 Update Appx. 1 at 30.

(iv) creating a second training set for a second stage of training comprised of the first training set and digital non-facial images that are incorrectly detected as facial images after the first stage of training; and

(iv) training the neural network in a second stage using the second training set.[56]

Such an application would be patent eligible under Step 1, because it would not be directed towards an abstract idea: the claims does not recite any "mathematical relationships, formulas, or calculations" because "mathematical concepts are not recited in the claims"; "mental process because the steps are not practically performed in the human mind"; and "any method of organizing human activity."[57]

<p style="text-align:center">(b)  July 2024 Updated Guidance</p>

In July 2024, USPTO issued its 2024 Guidance Update on Patent Subject Matter Eligibility, Including on Artificial Intelligence, including three new detailed examples applying USPTO's Section 101 patent eligibility analysis to hypothetical AI inventions.[58] The 2024 Guidance Update was prepared pursuant to Executive Order 14110, which called for revised guidance to "promote innovation and clarify issues" related to AI and intellectual property.[59]

In addition to providing guidance of patentability of AI-inventions, the 2024 Updated Guidance provided further explanations of Step 2A of the *Alice* analysis. Under Prong 1, examiners are still directed to determine whether a claim "recites" an abstract idea or one that merely involves (or is based on) an abstract idea.[60] Categories of "abstract ideas" include: mathematical concepts, certain methods of organizing human activity, or mental processes.[61]

The 2024 Updated Guidance provides a few new examples of claims that it considers not to be an abstract idea, including:

- An application-specific integrated circuit (ASIC) for an artificial neural network, the ASIC comprising: a plurality of neurons organized in an array, wherein each neuron comprises a register, a processing element and at least one input, and a plurality of synaptic circuits, each synaptic circuit including a memory for storing a synaptic weight, wherein each neuron is connected to at least one other neuron via one of the plurality of synaptic circuits.

- A system for monitoring health and activity in a herd of dairy livestock animals comprising: a memory; a processor coupled to the memory programmed with executable instructions, the instructions including a livestock interface for obtaining animal-specific information for a plurality of animals in the herd, wherein the animal-specific information comprises animal identification data and at least one of body position data, body temperature data, feeding behavior data, and movement pattern data; and a herd monitor including (a) a radio frequency

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[56] Example 39

[57] *Id.*

[58] 89 Fed. Reg. 58128, 2024 WL 3426934 (July 17, 2024) ("2024 Updated Guidance").

[59] On October 30, 2023, then-President Biden issued an Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence, E.O. 14110 (Oct. 31, 2023). That EO promoted "innovation, competition, and collaboration" in the area of AI and called for "tackling novel intellectual property (IP) questions." *Id.* § 2(b). It called for the Director of the USPTO to publish guidance on (1) "inventorship and the use of AI, including generative AI, in the inventive process" and (2) "other considerations at the intersection of AI and IP." *Id.* § 5.2 (c)(i)-(ii). EO 14110 was rescinded by President Trump in January 2025.

[60] 2024 WL 3426934, at 58134.

[61] *Id.* at 58135–36.

reader for collecting the animal-specific information from a plurality of animal sensors attached to the animals in the herd when the animal sensors are within proximity to the radio frequency reader, each animal sensor having a radio frequency transponder, and (b) a transmitter for transmitting the collected animal-specific information to the livestock interface.

- A treatment method comprising administering rapamycin to a patient identified as having Nephritic Autoimmune Syndrome Type 3 (NAS-3).[62]

Under Prong 2 of Step 2A, the examiner must determine whether the claim, as a whole, incorporates the alleged abstract idea into a practical application of the idea.[63] The claim's features should "apply, rely on, or use the judicial exception in a manner that imposes a meaningful limit on the judicial exception" to avoid pre-empting the field.[64] According to the Guidance, AI technologies may satisfy Prong 2 "improv[ing] the functioning of a computer or improves another technology or technical field."[65]

The guidance provides further guidance on when AI inventions may satisfy Prong 2 of Step 2A, such as when AI claims "a specific application of AI to a particular . . . problem":

> An important consideration in determining whether a claim improves technology is the extent to which the claim covers a particular solution to a problem or a particular way to achieve a desired outcome, as opposed to merely claiming the idea of a solution or outcome." AI inventions may provide a particular way to achieve a desired outcome when they claim, for example, a specific application of AI to a particular technological field (i.e., a particular solution to a problem). In these situations, the claim is not merely to the idea of a solution or outcome and amounts to more than merely "applying" the judicial exception or generally linking the judicial exception to a field of use or technological environment. In other words, the claim reflects an improvement in a computer or other technology.[66]

The 2024 Updated Guidance also provides eligibility analysis based on hypothetical AI-inventions, including an hypothetical claim involving the use of an artificial neural network, methods for analyzing speech signals, and assist in personalizing medical treatment.[67]

### 2. 2025 Guidance on Subject Matter Eligibility of AI Inventions

#### (a) Reminders on Evaluated SME (Aug. 4, 2025)

On August 4, 2025, the USPTO Deputy Commission for Patents Charles Kim issued a [Memo] titled "Reminders on evaluating subject matter eligibility of claims under 25 U.S.C. 101."[68] The Memo offered several "reminders" on existing guidance on subject matter eligibility, signaling USPTO leadership would be more closely evaluating examiner decisions and enforcing existing guidance.

The August 4, 2025 Memo makes five main points for examiners that signals to examiners to relax subject-matter-eligibility-review standards when evaluating AI-related patents:

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[62] *Id.* at 58135

[63] *Id.* at 58136.

[64] *Id.*

[65] *Id.* at 58137.

[66] *Id.* at 58137.

[67] *Id.*

[68] Charles Kim, Memo re Reminders on evaluating subject matter eligibility under 35 U.S.C. 101 (Aug. 4, 2025),

1. The Memo first reemphasized that "[t]he mental process grouping [has] limits" and reminded examiners "not to expand this grouping in a manner that encompasses claim limitations that cannot practically be performed in the human mind." The memo states "Claim limitations that encompass AI in a way that cannot be practically performed in the human mind do not fall within this grouping." Though these statements were taken from the 2024 Guidance Update, it signals a rebuke of any examiners treating the "mental process" exception as too expansive.[69]

2. The Memo second reemphasized that not all AI patent claims "recite" an abstract idea—claims that merely "involve" but do not "recite" an abstract idea do not trigger further eligibility review under Section 101. The memo contrasts Eligibility Examples 39 and 47. The memo distinguishes between generally reciting "training a neural network" (which is eligible Example 39) and specifically reciting mathematically concepts used for training, such as "back propagation" or "gradient descent" (which is ineligible Example 47). This signals a potential return to allowing applicants to show eligibility at Step 1.[70]

3. The Memo third reemphasized that AI claims should be analyzed "as a whole" when determining if a claim integrates a judicial exception into a practical application, rather than evaluating limitations "in a vacuum, completely separate from the recited judicial exception. Examiners are directed to "take into consideration all the claim limitations and how these limitations interact and impact each other." This is a rebuke of examiners dividing claims into words and phrases that appear to recite "abstract ideas" and other remaining words to be "recited at a high level of generality."[71]

4. The Memo fourth reemphasizes that AI claims that recite abstract ideas may nonetheless be patent eligible if they reflect an improvement to computer technology or to another area of technology. To determine if this applies, examiners are direct to "consult the specification to determine whether the disclosed invention improves technology or a technical field." Such an improvement should be "apparent to one of ordinary skill in the art."[72]

5. The Memo fifth reminds examiners that when presented with a "close call" of whether a claim is eligible under Section 101, examiners should err towards finding the claim is eligible. Unless "it is more likely than not (i.e., more than 50%" that the claim is ineligible, the examiner should not reject the patent application as ineligible under Section 101.[73]

(b)     Patent Signing Ceremony (Sept. 23, 2025)

On September 23, 2025, John Squires was sworn-in as Under Secretary of Commerce and Director of the USPTO. On his first day, he issued two patents, one being related to distributed ledger/cryptocurrency technology and the other medical diagnostics, under the promise of a "strong, robust, expansive, and resilient intellectual property system."[74] During the signing ceremony, he highlighted both areas — crypto currency and diagnostic practices — were areas of "great, but . . . unproductive, debate," signaling a desire to prioritize USPTO patent applications

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[69]  *Id.* at 1-2.
[70]  *Id.* at 2-3.
[71]  *Id.* at 3-4.
[72]  *Id.* at 4.
[73]  *Id.* at 5.
[74]  *USPTO Director John A. Squires issues first patents of tenure*, Press Release: 25-11 (Sept. 24, 2025), https://www.uspto.gov/about-us/news-updates/uspto-director-john-squires-issues-first-patents-tenure.

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involving emerging technologies.[75]  To emphasize this point, he offered a copy of Samuel Morse telegraph patent from 1840 as an example of "apaplied technologies [being] foundational" to the American patent system.[76]

<p style="text-align:center">(c)     <i>In re Desjardins</i>, App. No. 2024-000567 (Sept. 26, 2025)</p>

On September 26, 2025, three days after being sworn-in, Director Squires issued an Appeals Review Panel (ARP) decision in *In re Desjardins*, PTAB App. No. 2024-000567, that *sua sponte* vacated a Patent Trial and Appeal Board ("PTAB") Section 101 rejection of a patent application involving AI, concluding that the Board had misapplied Step 2A of USPTO's patent subject-mater eligibility analysis.  The decision involved a patent filed by Google (US Patent Application Pub. No. 2019/0236482 AI) related to methods and systems for training machine learning models.[77] The application addressed the problem of "catastrophic forgetting," which is where a machine learning model trained on multiple tasks loses "knowledge of previous tasks" when a new task is learned.[78]  The examiner evaluating Google's application rejected the application on Section 103 obviousness grounds.[79]

Following the denial, Google appealed to the PTAB.[80]  On appeal, the PTAB *sue sponte* applied the two-step *Alice* analysis to find that Google's application was not patent eligible under Section 101 because (1) it claimed a recitation of a "mathematical concept" and (2) it lacked an "additional element (or combination of elements) . . . that may have integrated the judicial exception into a practical application."[81]  It thus affirmed the examiner's decision under *both* Sections 101 and 103.[82]  The PTAB denied Google's request for rehearing on July 14, 2025, citing the Federal Circuit's decision in *Recentive Analytics, Inc. v. Fox Corp.*, 134 F. 4th 1205 (Fed. Cir. 2025) in support of its decision.[83]

Director Squires issued an APR reversal of the PTAB on September 26, 2025, vacating the PTAB's new ground of rejection under Section 101.[84]  The ARP agreed with the PTAB that Google's AI patent application recited a judicial exception under *Alice* Step 1, because it included a claim that recited a "mathematical calculation"—i.e., an "abstract idea."[85]  The ARP nonetheless held that the PTAB erred in applying *Alice* Step 2, because the claims were directed to a technological "improvement in the functioning of a computer."[86]  Specifically, claim one asserted that it reflected an "improvement to how the machine learning model itself operates, and not, for example, the identified mathematical calculation."[87]  The ARP relied upon on the specification that disclosed the application's claims "address[ed] challenges in continual learning and model efficiency by reducing storage requirements and preserving task performance across sequential training."[88]  The ARP also relied upon *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327

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[75]  Remarks by John A. Squires, Patent Signing Ceremony (Sept. 23, 2025), https://www.uspto.gov/about-us/news-updates/patent-signing-ceremony.

[76]  *Id.*

[77]  *Id.* at 2-3.

[78]  *Id.* at 3, 7.

[79]  *Id.* at 4.

[80]  *Id.*

[81]  *Id.* at 6–7.

[82]  *See id.*

[83]  *In re Desjardins*, PTAB Appeal 2024-00567, at 7 (July  14, 2025). The *Recentive* case is discussed *infra* in Section III.A.3.

[84]  *In re Desjardins*, PTAB Appeal 2024-000567, at 1 (Sept. 26, 2025).

[85]  *Id.* at 6-7 ("Independent claim 1 recites 'computing . . . , an approximation of a posterior distribution over possible values of the plurality of parameters.' Independent claims 18 and 19 recite similar limitations.").

[86]  *Id.* at 7.

[87]  *Id.*

[88]  *Id.*

(Fed. Cir. 2016) for the proposition that claims directed towards an "improvement to computer functionality" could be patentable.[89]

In reaching this conclusion, the ARP also noted it found the PTAB's error "troubling," explaining its policy rationale that "excluding AI innovations from patent protection in the United States jeopardizes America's leadership in this critical emerging technology."[90] The ARP was concerned that, under the PTAB's reasoning, "many AI innovations are potentially unpatentable—even if they are adequately described and nonobvious—because the panel essentially equated any machine learning with an unpatentable 'algorithm' and the remaining additional elements as 'generic computer components.'"[91] The ARP directed the PTAB to "treat [ ] precedent with more care" and found that novelty, non-obviousness, specification are "the traditional and appropriate tools to limit patent protection to its proper scope."[92]

The ARP thus vacated the PTAB's new ground for rejection under Section 101, while leaving undisturbed the Section 103 rejection.[93] On November 4, 2025, Director Squires designed *Desjardins* as precedential to ensure the decision is bindings and AI-related improvements to existing technology can be patent eligible.

(d)     Memos on SME and SME Declarations  (Dec. 4, 2025)

On December 4, 2025, Director Squires issued two memos: (1) on Best Practices for Submission of Rule 132 Subject Matter Eligibility Declarations (SMEDs) to overcome Section 101 eligibility denials[94]; and (2) to examiners on Subject Matter Eligibility Declarations, reaffirming the Director's approach in *In re Desjardins* and offering guidance on how examiners should consider subject-matter-eligibility declarations.[95]

From the Memo on best practices for submitting Rule 132 declarations, Director Squires provided the following guidance to applicants when submitting SMEDs to provide additional evidence to address Section 101 denials:

1. To be considered relevant to eligibility, "there must be a nexus between the [applicant's claim] and the evidence provided in the declaration." In the ordinary course, "a SMED may demonstrate how one of ordinary skill in the art would interpret a specification that describes a technological improvement to show [patent elibility]." However, a SMED cannot "improperly supplement the specification and must be timely filed."

2. Applicants are encouraged to submit separate SMEDs for subject-matter eligibility and other reasons for denial, to "avoid the risk of intertwining issues of enablement, written description, novelty and nonobviousness with those of subject matter eligibility." With respect to subject matter eligibility, the SMED should provide evidence addressing the reason for the rejection.

From the Memo to examiners on subject matter eligibility, Director Squires reaffirms his intent to ease standards for subject matter eligibility for emerging technologies.  First, the memo reaffirms the reasoning of the *In re Desjardins* decision, emphasizing that its binding on examiners and the

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89  *Id.* at 8.
90  *Id.* at 9.
91  *Id.*
92  *Id.* at 10.
93  *Id.* at 4, 10.
94  John A. Squires, Memo re Best Practices for Submission of Rule 132 Subject Matter Eligibility Declarations (SMEDs) (Dec. 4, 2025).
95  John A. Squires, Memo re Subject Matter Eligibility Declarations (Dec. 4, 2025).

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PTAB.[96]  The memo highlights that under *Desjardins*, improvement in computing processes can constitute a patent-eligible technological advancement and novelty, nonobviousness, and specificity and "the proper inquiring for defining the scope of patent prosecution."[97]  The memo goes on to provide additional guidance on when emerging technologies add "something more" under Step 2B of the *Alice* framework—providing guidance and examples for examiners to use when evaluating whether SMEDs adequately address Section 101 denials.[98]

### 3.  Caselaw on SME of AI-Related Inventions: Recentive Analytics, Inc. v. Fox Corp., 134 F.4th 1205 (Fed. Cir. 2025)

Though USPTO guidance may be binding upon examiners and PTAB, courts still have the final say when it comes to interpreting the law.  As the Federal Circuit has held, USPTO guidance is "not binding on [the] court[s], but may be given judicial notice to the extent they do not conflict with the statute."[99]  To the extent USPTO guidance is relevant, it is important to remember that "this guidance is not, itself, the law of patent eligibility, does not carry the force of law, and is not binding on our patent eligibility cases."[100]  In fact, if the guidance "contradictions or does not full accord with our caselaw, it is our caselaw, and the Supreme Court precedent it is based upon, that must control."[101]

Prior to 2025, the Federal Circuit has not weighed in upon the subject matter eligibility of AI Inventions.  The Federal Circuit issued its first opinion on the issue of the subject matter eligibility of AI—specifically machine learning—in *Recentive Analytics, Inc. v. Fox Corp.*, holding that applying "generic" machine-learning techniques to a new data environment or to automate a task previously performed manually by humans, without disclosing improvements to the machine-learning programs themselves, was not patent eligible.[102]  At a high-level, the patents at issue purported to use machine learning to "optimize the scheduling of live events and . . . 'network maps,' which determine the programs or content displayed by a broadcaster's channels within certain geographic markets at particular times."[103]

The court first concluded that the patents were directed towards an abstract concept under *Alice* step one.[104]  Recentive conceded that the concept of "network maps" had previously existed for a long time and the patents did not claim any new machine learning techniques itself, rather, they instead "'claimed the application of the machine learning technique to the specific context[s]' of event scheduling and network map creation."[105]  The court rejected this argument, concluding that "[b]oth sets of patents rely on the use of generic machine learning technology in carrying out the claimed methods for generating event schedules and network maps."  *Id.* at 11. The asserted claim that the "model would be 'iteratively trained' or dynamically adjusted" in the patents did not represent a technological improvement—rather such methods "are incident to the very nature of machine learning."[106]

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[96]  *Id.*
[97]  *Id.*
[98]  *Id.* at 2-7.
[99]  *In re Fisher*, 421 F.3d 1265, 1372 (Fed. Cir. 2005).
[100]  *cxLoyalty, Inc. v. Maritz Hldgs. Inc.*, 986 F.3d 1367, 1375 n.1 (Fed. Cir. 2021).
[101]  *Id.*
[102]  134 F.4th 1205 (Fed. Cir. 2025), slip op. at 2, 18.
[103]  *Id.* at 2-3.
[104]  *Id.* at 10-16.
[105]  *Id.* at 11.
[106]  *Id.* at 12.

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Under *Alice* step two, the court concluded that the claims did not involve an inventive concept.[107] On this issue, Recentive argued that the patents included an inventive concept because the patent application claims involved "using machine learning to dynamically generate optimized maps and schedules based on real-time data and update them based on changing conditions."[108] the unique application of machine learning to generate customized algorithms, based on training the machine learning model, that can then be used to automatically create . . . event schedules that are updated in real time."[109] The court concluded "this is no more than claiming the abstract idea itself," and the application failed to "identify anything in the claims that would 'transform' the claimed abstract idea into a patent-eligible application.'"[110]

Courts and commentators have been quick to conclude that *Recentive* likely does not doom AI-related patent applications, including applications that claim an improvement upon existing in AI models or the application of AI-models in inventive ways. But special care must be made to include disclosures for how the claimed invention satisfies the *Alice* test, meaning the claim either (1) "focus[es] on 'the specific asserted improvement in computer capabilities'" or (2) includes "additional elements [that] 'transform the nature of the claim' into a patent-eligible application."[111] In *Recentive*, the applicant failed to do both because: (i) iterative training and real-time updates were not a technical improvement on existing machine learning models, and (ii) routine applications of machine learning to new environments or to improve upon human-performance is insufficient to transform the claim into something more than the abstract idea.

When assessing claims for applications of AI-models, patents that purport applications of AI in new ways may still be eligible, but showing eligibility depends on the nature of the advancement. For example, in *Aon Re, Inc. v. Zesty.AI, Inc.*, a district court distinguished from *Recentive* this way:

> Recently, the Federal Circuit acknowledged the burgeoning field of artificial intelligence but held that patent owners *may not claim the mere application of generic machine learning to new data environments*. Aon's patents do not offer a new twist on machine learning itself. But that is not fatal, because we agree with Aon that *the patents recite the patent-eligible arrangement of two independently trained classifiers to analyze property characteristics and conditions*.[112]

The court went on to explain that the claim at issue purported to "solve a specific technical problem," and was therefore eligible:

> Rather than referring to the use of machine learning in general, the claim requires individually trained classifiers that operate independently, performing separate and clearly defined analytical tasks: one classifier identifies a specific physical characteristic of a property from aerial imagery, and the other independently assesses the condition of that characteristic. This division of labor, together with the requirement to analyze defined pixel groupings and produce risk assessment outputs based on the classifiers' assessments, confirms that *the claim represents more than a generalized use of machine learning*. Although the patent does not purport to invent machine learning algorithms, computer hardware, or the general concept of aerial imagery analysis or risk assessment, *it does specifically define how these known components must be structured to achieve a*

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107    *Id.* at 17.
108    *Id.* at 16.
109    *Id.*
110    *Id.* at 16-17.
111    *Id.* at 1212, 1214.
112    791 F. Supp. 3d 531, 533 (D. De. 2025).

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> *supposed technological improvement in accuracy and efficiency to the combination of those components*.[113]

Put differently, to be patent-eligible, patent practitioners and applicants must do more than recite a conventional machine learning approaches.  If a claim "merely direct that [certain] algorithms be used, without defining how they are to be used to achieve the claimed objectives," then the application is not likely to be for an eligible subject matter.[114]  Instead, the patent must explain "how to implement [the] algorithms" and "claim technological improvements to those machine learning algorithms."[115]  In other words, the patent must specifically explain how the implementation of the machine learning in being used to solve a technical problem in order to improv[e] computer functionality."[116]

## B.  USPTO Inventorship Guidance on AI-Assisted Inventions

### 1.  February 2024 Inventorship Guidance

In February 2024, the USPTO issued its Inventorship Guidance for AI-Assisted Inventions ("2024 Inventorship Guidance") that was written to provide clarity on how "USPTO will analyze inventorship issues as AI systems, including generative AI, play a greater role in the innovation process."[117]  Under the 2024 Inventorship Guidance, any natural persons who created an invention using AI were required to show they contributed significantly to the invention under the *Pannu* factors.[118]  In addition to this showing, the applicant had to show a natural person contributed significantly "to each claim in a patent application."[119]  This analysis would occur on a claim-by-claim and case-by-case basis.[120]

The following "guiding principles" were outlined for examiners to consider when "[d]etermining whether a natural person's contribution in AI-assisted inventions is significant":

> 1.  A natural person's use of an AI system in creating an AI-assisted invention does not negate the person's contributions as an inventor.[121] The natural person can be listed

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[113]  *Id.* at 539.

[114]  *All Terminal Srvs., LLC v. Roboflow, Inc.*, 2025 WL 2576394, at *10 (D. Del. 2025).  "Although ConGlobal is correct that the specification contemplates the use of specific types of algorithms, e.g., '148 patent, col. 7, ll. 29–37 (OCR, convolutional neural network, and recurrent neural network), the patent does not explain how to implement those algorithms, much less claim technological improvements to those machine learning algorithms. Instead, the few claims that do identify such algorithms merely direct that those algorithms be used, without defining how they are to be used to achieve the claimed objectives."  *Id.*

[115]  *Id.*

[116]  *Nielson Co. (US), LLC v. Hyphametrics, Inc. *, 2025 WL 2051443, at **6-7 (D. Del. 2025).

[117]  89 Fed. Rep. 10043-01, 2024 WL 553179, at *10044 (Feb. 13, 2024) .

[118]   *Id.* at *10047-48.  The *Pannu* factors require that the inventor contribute in a significant manner, meaning that they must: "(1) contribute in some significant manner to the conception or reduction to practice of the invention, (2) make a contribution to the claimed invention that is not insignificant in quality, when that contribution is measured against the dimension of the full invention, and (3) do more than merely explain to the real inventors well-known concepts and/or the current state of the art."  *Pannu v. Iolab Corp.*, 155 F.3d 1344, 1351 (Fed. Cir. 1998).  Failure to meet any of these factors can result in failure from being named an inventor.  *Id.*

[119]  2024 WL 553179, at *10048.

[120]  *Id.* at *10047-48.

[121]  2024 WL 553179, at *10048-49 n. 53 (citing *Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 758 F.2d 613, 624 (Fed. Cir. 1985) ("An inventor 'may use the services, ideas, and aid of others in the process of perfecting [their] invention without losing [their] right to a patent."') (quoting *Hobbs v. U.S. Atomic Energy Comm.*, 451 F.2d 849, 864 (5th Cir. 1971))).

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as the inventor or joint inventor if the natural person contributes significantly to the AI-assisted invention.

2. Merely recognizing a problem or having a general goal or research plan to pursue does not rise to the level of conception.[122] A natural person who only presents a problem to an AI system may not be a proper inventor or joint inventor of an invention identified from the output of the AI system. However, a significant contribution could be shown by the way the person constructs the prompt in view of a specific problem to elicit a particular solution from the AI system.

3. Reducing an invention to practice alone is not a significant contribution that rises to the level of inventorship.[123] Therefore, a natural person who merely recognizes and appreciates the output of an AI system as an invention, particularly when the properties and utility of the output are apparent to those of ordinary skill, is not necessarily an inventor.[124] However, a person who takes the output of an AI system and makes a significant contribution to the output to create an invention may be a proper inventor. Alternatively, in certain situations, a person who conducts a successful experiment using the AI system's output could demonstrate that the person provided a significant contribution to the invention even if that person is unable to establish conception until the invention has been reduced to practice.[125]

4. A natural person who develops an essential building block from which the claimed invention is derived may be considered to have provided a significant contribution to the conception of the claimed invention even though the person was not present for or a participant in each activity that led to the conception of the claimed invention.[126] In some situations, the natural person(s) who designs, builds, or trains an AI system in view of a specific problem to elicit a particular solution could be an inventor, where the designing, building, or training of the AI system is a significant contribution to the invention created with the AI system.

5. Maintaining "intellectual domination" over an AI system does not, on its own, make a person an inventor of any inventions created through the use of the AI system.[127] Therefore, a person simply owning or overseeing an AI system that is used in the

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[122] *Id.* n. 54 (citing *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1228 (Fed. Cir. 1994) ("An idea is definite and permanent when the inventor has a specific, settled idea, a particular solution to the problem at hand, not just a general goal or research plan [the inventor] hopes to pursue."); *Hitzeman v. Rutter*, 243 F.3d 1345, 1357-58 (Fed Cir. 2001); *In re Verhoef*, 888 F.3d 1362, 1366 (Fed. Cir. 2018) (Verhoef's recognition of the problem of connecting the cord of the harness to the dog's toes did not make Verhoef the sole inventor; Lamb's proposed solution to that problem was a significant contribution)).

[123] *Id.* n. 55 (citing MPEP 2109 subsec. III).

[124] *Id.* n. 56 (citing *See e.g.*, *Solvay S.A. v. Honeywell Intern. Inc.*, 622 F.3d 1367, 1378-79 (Fed. Cir. 2010) (finding that deriving the invention of another and appreciating what was made did not rise to the level of conception)).

[125] *Id.* n. 57 (citing MPEP 2138.04 subsec. II; *Dana-Farber Cancer Inst., Inc. v. Ono Pharm. Co.*, 964 F.3d 1365, 1373-74 (Fed. Cir. 2020) (Dr. Freeman's identification of the 292 sequences in the BLAST database (an automated search tool for finding similarity between biological sequences) and subsequent immunohistochemistry experiments to identify several types of tumors that express PD-L1 were found sufficient to make him a joint inventor.)).

[126] *Id.* n. 58 (citing *Dana-Farber*, 964 F.3d at 1372-74 (Drs. Freeman and Wood were found to be joint inventors even though they did not conceive of the claimed invention of using anti-PD-1 antibodies to treat tumors but instead discovered the expression of PD-L1 in human tumors and that PD-1/PD-LI interaction inhibits the immune response.)).

[127] *Id.* n. 59 (citing *Verhoef*, 888 F.3d at 1367 (court refused to endorse the "intellectual domination" language and emphasized that the person who conceives of the invention is the inventor)).

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creation of an invention, without providing a significant contribution to the conception of the invention, does not make that person an inventor.[128]

2.      November 2025 Revised Inventorship Guidance

On November 26, 2025, the USPTO Director John Squires issued Revised Inventorship Guidance for AI-Assisted Inventions ("Revised Inventorship Guidance"), rescinding the 2024 Inventorship Guidance in its entirety.[129]  The Revised Inventorship Guidance stated that "the *Pannu* factors only apply when determining whether multiple natural persons qualify as joint inventors" and were "inapplicable when only one natural person is involved in developing an invention with AI."[130]  The revised guidance agrees "AI cannot be named as an inventor on a patent application (or issued patent) and that only natural persons can be inventors," but it offers different guidance on determining inventorship.[131]

Instead of focusing on the *Pannu* factors, the Revised Inventorship Guidance declares that that examiners should evaluate applications involving a single natural person that is seeking a patent for an AI-assisted inventions under the doctrine of conception.  "When one natural person is involved in creating an invention with the assistance of AI, the inquiry is whether that person conceived the invention under the traditional conception standard" — where conception is "the formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice."[132]  However, the revised guidance provides that where multiple natural persons are involved in creating an invention through AI, examiners should look to the *Pannu* factors to determine whether each alleged inventor qualifies as a "joint inventor" of the discovery or invention.[133]

Under Federal Circuit caselaw, conception is "the touchstone of inventorship, the completion of the mental part of the invention."[134]  "It is 'the formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice.'"[135]  Inventorship "is complete only when the idea is so clearly defined in the inventor's mind that only ordinary skill [in the art] would be necessary to reduce the invention to practice, without extensive research of experimentation."[136]  In other words, it must be a "specific, settled idea, a particular solution to the problem at hand, not just a general goal or research plan [one] hopes to pursue."[137]  Proving conception requires collaborating evidence, since it is a mental act, such as "contemporaneous disclosure that would enable one skilled in the art to make the invention."[138]

The Revised Inventorship Guidance offers a new philosophy reflecting the view that AI is a tool to be used by inventors.  Instead of viewing AI like collaborators, the guidance states that Generative AI models "are instruments used by human inventors"—"analogous to laboratory equipment, computer software, research databases, or any other tool that assists in the inventive process."[139]  Under this permissive view, AI tools are like

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[128]  2024 WL 553179, at *10048-49 & nn. 53-59.
[129]  Docket No. PTO-P-2025-0014, at 1 (Feb. 13, 2024).
[130]  *Id.* at 1-2.
[131]  *Id.* at 2.

[132]  *Id.* at 2-3 (quoting *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1228 (Fed. Cir. 1994)).
[133]  *Id.* at 3.
[134]  *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223 (1994).
[135]  *Id.* (quoting *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1376 (Fed. Cir. 2986)).
[136]  *Id.*
[137]  *Dawson v. Dawson*, 701 F.3d 1347, 1352 (Fed. Cir. 2013) (citation omitted).
[138]  *Id.*
[139]  *Id.* at 3.

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"services, ideas, and aid of others" that do not automatically become co-inventors by relying on them.[140]

# IV.    The Future of Patent Law and AI

It remains to be seen whether recent guidance issued under Director Squires signals a broader, permanent reorientation of the USPTO's approach to considering patent applications for AI-inventions and AI-assisted inventions.  It also remains to be seen whether courts find Director Squires approach persuasive, or whether the courts will apply subject-matter eligibility criteria  to reject AI-related patents. Going forward, in-house counsel of company's investing time and resources into AI with hopes of securing patent rights, and practitioners wishing to give their clients sound advice, would be advised to keep an eye on decisions coming from the USPTO in the coming days and months.

With respect to subject-matter eligibility, Director Squires has signaled that he will be placing extra scrutiny on PTAB rejections of AI-related patent claims—and those related to other emerging technologies—under Section 101.  *In re Desjardins* signals that USPTO may give applicants more opportunity to prove subject-mater eligibility of AI-related patents and whether their AI-related inventions are directed to improving existing technology or solving specific technical issues.  Even if the USPTO and courts do significantly move away from rejecting applications under Section 101, however, applicants will still need to navigate challenges surrounding proving novelty, non-obviousness, and specificity.  And as companies continue to saturate the AI space — and the barriers to entry for contributing to AI-related technologies decrease — applicants may face additional hurdles showing these requirements are met.

With respect to inventorship of AI-assisted inventions, Director Squires' updated guidance—and decision to rescind the February 2024 Inventorship Guidance—signals a shift towards allowing more liberal use of AI and AI Agents as "tools" of innovation, which may favor early-adopters of this technology.  The decision may also improve efficiency and lower the costs of prosecuting patents for AI-assisted inventions by removing the need to prove a natural person made a substantial contribution to each claim of an application under the *Pannu* factors.  At the same time, this decision may lead to unintended consequences, such as raising the stakes of proving novelty and non-obviousness and increasing the risk of patent trolling from using AI to quickly generate patents in a large number of potential applications—regardless of whether there is currently a conceivable need for the patent. Only time will tell how the USPTO and courts will strike a balance between incentivizing innovation and ensuring that no company obtains a monopoly over AI-related inventions.

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This note discusses ongoing developments at the USPTO and case law regarding intellectual property rights — specifically patent rights — for developers of AI-related technology and the use of generative AI in the invention process.  As should be clear, each patent application is unique and its success depends on numerous factors, including the strengths of your legal counsel.  If you have any questions about the issues raised in this note, please do not hesitate to reach out to:

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[140]    *Id.*

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