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Overview of USPTO's July 2024 guidance on patent subject matter eligibility concerning AI-related inventions

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USPTO's July 2024 guidance

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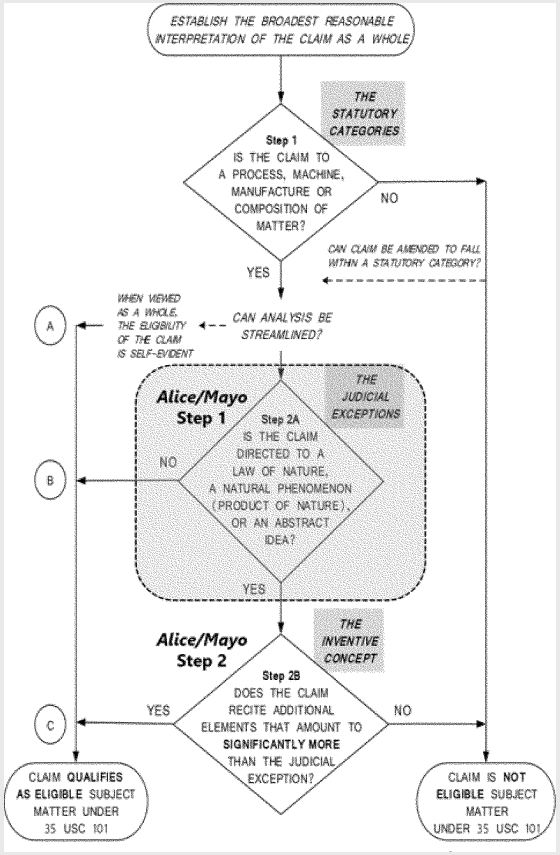
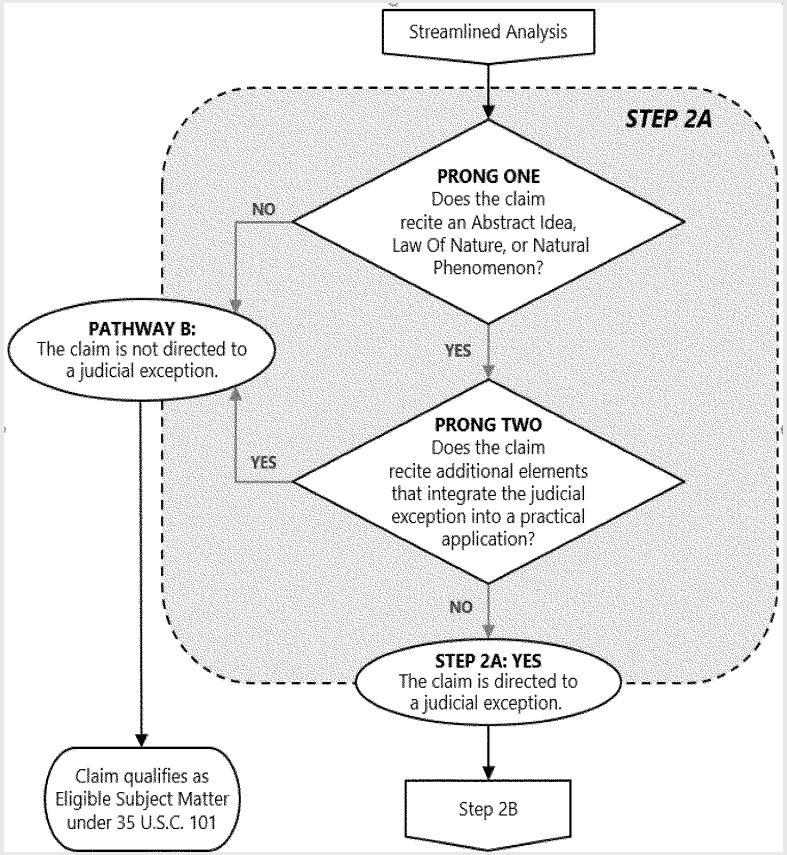
Overview of the USPTO's Patent Subject Matter Eligibility Guidance





Overview of the USPTO's Patent Subject Matter Eligibility Guidance

- Step 1 of the USPTO's subject matter eligibility analysis addresses whether the claimed invention falls into at least one of the four categories.
- Step 2 of the USPTO's subject matter eligibility analysis applies the Supreme Court's two-part framework (*Alice/Mayo* Steps 1 and 2 in the above flowchart) to identify claims that are directed to a judicial exception and to then evaluate if additional elements of the claim provide an inventive concept.
  - Step 2A, Prong One - a determination of whether a claim recites (*i.e.,* sets forth or describes) a judicial exception.
  - Step 2A, Prong Two - a determination of whether the claim integrates the recited judicial exception into a practical application of the exception.
  - Step 2B – a determination of whether the claim recites additional elements that amount to significantly more than the judicial exception.

Update on Certain Areas of the USPTO's Patent Subject Matter Eligibility Guidance Applicable to AI Inventions

A. Evaluation of whether a claim recites an abstract idea in Step 2A, Prong One

B. Evaluation of the improvements consideration in Step 2A, Prong Two

A. The evaluation of whether a claim recites an abstract idea in Step 2A, Prong One

- MPEP 2106.04(a)(1) provides non-limiting hypothetical examples of claims that do and do not recite an abstract idea.
- The USPTO has also issued examples that illustrate an analysis of claims that do and do not recite an abstract idea.
- Additional non-limiting hypothetical examples of claims that do **not** recite an abstract idea:
  - Example 47 (claim 1)
  - Example 46 (claim 4) (collection information from sensors, transmitting information to an interface)
  - Example 43 (claim 5)

A. The evaluation of whether a claim recites an abstract idea in Step 2A, Prong One

- Mathematical Concepts
  - A claim does not recite a mathematical concept (*i.e.,* the claim limitations do not fall within the mathematical concept grouping) if it is **only based on** or **involves** a mathematical concept.
  - In *XY, LLC v. Trans Ova Genetics*, 968 F.3d 1323, 1330–32 (Fed. Cir. 2020), the Federal Circuit determined that claims to a method of operating a flow cytometry apparatus to classify and sort particles into at least two populations in real time to more accurately classify similar particles was **not** directed to "the abstract idea of using a 'mathematical equation that permits rotating multi-dimensional data' " even though they may have **involved** mathematical concepts.

A. The evaluation of whether a claim recites an abstract idea in Step 2A, Prong One

- Certain Methods of Organizing Human Activity
  - Claims to "collect[ing] information on a user's movements and location history [and] electronically record[ing] that data" (*i.e.,* "creating a digital travel log") fall within this grouping.
  - A claim to "monitoring the location of a mobile thing and notifying a party in advance of arrival of that mobile thing falls within this grouping
  - Claims to methods for detecting fraud in financial transactions during a payment clearing process, including determining when there is a match between two financial records, sending a notification to a bank with authorization to process the financial transaction when there is a match, and sending a notification to a bank to not process the financial transaction when there is not a match, fall within this grouping.

A. Evaluation of whether a claim recites an abstract idea in Step 2A, Prong One

- Mental Processes
  - Claims do not recite a mental process when they contain limitations that cannot practically be performed in the human mind, for instance when the human mind is not equipped to perform the claim limitations.
  - Claim limitations that only encompass **AI** in a way that cannot practically be performed in the human mind do **not** fall within this grouping.
  - A claim to "a specific, hardware-based RFID serial number data structure" (i.e., an RFID transponder), where the data structure is uniquely encoded (i.e., there is "a unique correspondence between the data physically encoded on the [RFID transponder] with pre-authorized blocks of serial numbers") does **not** recite a mental process.

A. Evaluation of whether a claim recites an abstract idea in Step 2A, Prong One

- Mental Processes
  - A claim to a method of "(1) receiving user information; (2) providing a polling question; (3) receiving and storing an answer; (4) comparing that answer to generate a 'likelihood of match' with other users; and (5) displaying certain user profiles based on that likelihood" falls within this grouping.
  - A claim to "the collection of information from various sources (a Federal database, a State database, and a case worker) and understanding the meaning of that information (determining whether a person is receiving SSDI benefits and determining whether they are eligible for benefits under the law) falls within this grouping.
  - Claims to "the use of an algorithm- generated content-based identifier to perform the claimed data-management functions," which include limitations to "controlling access to data items," "retrieving and delivering copies of data items," and "marking copies of data items for deletion," fall within this grouping.

B. Evaluation of Whether the Claim as a Whole Integrates the Judicial Exception Into a Practical Application of That Exception (Step 2A, Prong Two)

- Evaluating improvements in the functioning of a computer, or an improvement to any other technology or technical field.
- Many claims to AI inventions are eligible as improvements to the functioning of a computer or improvements to another technology or technical field.
- Evaluating whether 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.
  - providing a particular way to achieve a desired outcome
  - a specific application of AI to a particular technological field
- An improvement can be provided by one or more additional elements or by the additional element(s) in combination with the recited judicial exception.

Applicability of the USPTO Eligibility Guidance to AI-Assisted Inventions

- The update clarifies that the method of invention development, including the use of AI, does not impact subject matter eligibility. Instead, the focus remains on the claimed invention itself, showing that AI-assisted inventions are evaluated on equal footing with other technologies. This distinction helps to ensure that AI's role as a tool does not exclude inventions from eligibility, provided there is significant human contribution.

Example 47

Claim 1 Step 2A, Prong one √	Claim 2 Step 2A, Prong one X Step 2A, Prong two X	Claim 2 Step 2A, Prong one X Step 2A, Prong two √
An application specific integrated circuit (ASIC) for an artificial neural network (ANN), the ASIC comprising: a plurality of neurons organized in an array, wherein each neuron comprises a register, a microprocessor, 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 method of using an artificial neural network (ANN) comprising: (a) receiving, at a computer, continuous training data; (b) discretizing, by the computer, the continuous training data to generate input data; (c) training, by the computer, the ANN based on the input data and a selected training algorithm to generate a trained ANN, wherein the selected training algorithm includes a backpropagation algorithm and a gradient descent algorithm; (d) detecting one or more anomalies in a data set using the trained ANN; (e) analyzing the one or more detected anomalies using the trained ANN to generate anomaly data; and (f) outputting the anomaly data from the trained ANN.	A method of using an artificial neural network (ANN) to detect malicious network packets comprising: (a) training, by a computer, the ANN based on input data and a selected training algorithm to generate a trained ANN, wherein the selected training algorithm includes a backpropagation algorithm and a gradient descent algorithm; (b) detecting one or more anomalies in network traffic using the trained ANN; (c) determining at least one detected anomaly is associated with one or more malicious network packets; (d) detecting a source address associated with the one or more malicious network packets in real time; (e) dropping the one or more malicious network packets in real time; and (f) blocking future traffic from the source address.

Example 48

Claim 1 Step 2A, Prong one X Step 2A, Prong two X	Claim 2 Step 2A, Prong one X Step 2A, Prong two √	Claim 2 Step 2A, Prong one X Step 2A, Prong two √
A speech separation method comprising: (a) receiving a mixed speech signal x comprising speech from multiple different sources sn, where n ∈ {1, . . . N}; (b) converting the mixed speech signal x into a spectrogram in a time-frequency domain using a short time Fourier transform and obtaining feature representation X, wherein X corresponds to the spectrogram of the mixed speech signal x and temporal features extracted from the mixed speech signal x; and (c) using a deep neural network (DNN) to determine embedding vectors V using the formula V = fθ(X), where fθ(X) is a global function of the mixed speech signal x.	The speech separation method of claim 1 further comprising: (d) partitioning the embedding vectors V into clusters corresponding to the different sources sn; (e) applying binary masks to the clusters to create masked clusters; (f) synthesizing speech waveforms from the masked clusters, wherein each speech waveform corresponds to a different source sn; (g) combining the speech waveforms to generate a mixed speech signal x' by stitching together the speech waveforms corresponding to the different sources sn, excluding the speech waveformfrom a target source ss such that the mixed speech signal x' includes speech waveforms from the different sources sn and excludes the speech waveform from the targetsource ss; and (h) transmitting the mixed speech signal x' for storage to a remote location.	A non-transitory computer-readable storage medium having computer-executable instructions stored thereon, which when executed by one or more processors, cause the one or more processors to perform operations comprising: (a) receiving a mixed speech signal x comprising speech from multiple different sources sn, where n ∈ {1, . . . N}, at a deep neural network (DNN) trained on source separation; (b) using the DNN to convert a time-frequency representation of the mixed speech signal x into embeddings in a feature space as a function of the mixed speech signal x; (c) clustering the embeddings using a k-means clustering algorithm; (d) applying binary masks to the clusters to obtain masked clusters; (e) converting the masked clusters into a time domain to obtain N separated speech signals corresponding to the different sourcessn; and (f) extracting spectral features from a target source sd of the N separated speech signals and generating a sequence of words from the spectral features to produce a transcript of the speech signal corresponding to the target source sd.

Example 49

Claim 1 Step 2A, Prong one X Step 2A, Prong two X	Claim 2 Step 2A, Prong one X Step 2A, Prong two √
A post-surgical fibrosis treatment method comprising: (a) collecting and genotyping a sample from a glaucoma patient to a provide a genotype dataset; (b) identifying the glaucoma patient as at high risk of post-implantation inflammation (PI) based on a weighted polygenic risk score that is generated from informative single-nucleotide polymorphisms (SNPs) in the genotype dataset by an ezAI model that uses multiplication to weight corresponding alleles in the dataset by their effect sizes and addition to sum the weighted values to provide the score; and (c) administering an appropriate treatment to the glaucoma patient at high risk of PI after microstent implant surgery,	The method of claim 1, wherein the appropriate treatment is Compound X eye drops.

Example 39

- A computer-implemented method of training a neural network for facial detection comprising:
  - collecting a set of digital facial images from a database;
  - applying one or more transformations to each digital facial image including mirroring, rotating, smoothing, or contrast reduction to create a modified set of digital facial images;
  - creating a first training set comprising the collected set of digital facial images, the modified set of digital facial images, and a set of digital non-facial images;
  - training the neural network in a first stage using the first training set;
  - creating a second training set for a second stage of training comprising the first training set and digital non-facial images that are incorrectly detected as facial images after the first stage of training; and
  - training the neural network in a second stage using the second training set.
- **Step 2A, Prong one √**

Summary

- 1. AI-related inventions are viewed by the USPTO as a subset of computer-implemented inventions
- 2. For the subject matter eligibility analysis under 35 U.S.C. 101, whether an invention was created with the assistance of AI is not a consideration in the application of the Alice/Mayo test and USPTO eligibility guidance and should not prevent USPTO personnel from determining that a claim is subject matter eligible. In other words, how an invention is developed is not relevant to the subject matter eligibility inquiry.
- 3. Make good use of the four examples to develop analogies
- 4. Guide the examiner through a clear and logical progression from the technical problem to the claimed innovation, highlight the practical application.
- 5. Integrate the AI with specific hardware components
- 6. Emphasize specific technical improvements attributed to AI innovation in the specification.
- Avoid Data processing claims
- 7. Gain insights from the Examiner and work collaboratively to find a mutually agreeable solution.

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THANK YOU