Criteria family. AI and Machine Learning Patentability.

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Artificial intelligence and machine learning inventions at the EPO

The EPO uses a “two hurdle test” when assessing the patentability of artificial intelligence inventions. In the Guidelines for Examination, the EPO defines AI and machine learning as being based on: “…computational models and algorithms for classification, clustering, regression and dimensionality reduction, such as neural networks, genetic algorithms, support vector machines, k-means, kernel regression and discriminant analysis.” When applied to AI and machine learning applications, the EPO typically defines this subject matter to be of an abstract mathematical nature.

(1) The first hurdle. When the claimed invention is based on a mathematical method, consideration will be made whether the mathematical method contributes to the technical character of the invention, i.e. does it contribute to producing a technical effect that serves a technical purpose? The two main criteria for a mathematical method to contribute to the technical character of an invention are the application to a field of **technology** or by being adapted to a specific technical implementation. There is a range of case law and examples related to these.

The Guidelines for Examination in the European Patent Office (EPC Guidelines) (April 2025 edition), Part G – Patentability, Chapter II – Inventions, 3.3 Mathematical methods, lists ‘examples of technical contributions of a mathematical method,’ including controlling a specific technical system or process, e.g. an X-ray apparatus;

The Guidelines for Examination in the European Patent Office (EPC Guidelines) (April 2025 edition), Part G – Patentability, Chapter II – Inventions, 3.3 Mathematical methods, lists ‘examples of technical contributions of a mathematical method,’ including digital audio, image or video enhancement or analysis, e.g. de-noising, detecting persons in a digital image, estimating the quality of a transmitted digital audio signal;

- The Guidelines for Examination in the European Patent Office (EPC Guidelines) (April 2025 edition), Part G – Patentability, Chapter II – Inventions, 3.3 Mathematical methods, lists ‘examples of technical contributions of a mathematical method,’ including providing a genotype estimate based on an analysis of DNA samples, as well as providing a confidence interval for this estimate so as to quantify its reliability; and

- The Guidelines for Examination in the European Patent Office (EPC Guidelines) (April 2025 edition), Part G – Patentability, Chapter II – Inventions, 3.3 Mathematical methods, lists ‘examples of technical contributions of a mathematical method,’ including providing a medical diagnosis by an automated system processing physiological measurements.

(2) The second hurdle relates to all of the criteria of patentability, such as novelty, inventive step and sufficiency.

(A) For assessment of inventive step, if there is a mixture of technical and non-technical claim elements; at the EPO this is assessed using the COMVIK approach

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(B) For assessment of ‘sufficiency of disclosure’. Article 83 EPC states that “*The European patent application shall disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art*.”

(C) For the technical contribution by computer implemented invention (Europe). A computer implemented invention is not excluded under the act if it makes a technical contribution to the state of the art. *Aerotel Ltd v. Telco Holdings Ltd. & Ors* [2006] EWCA Civ 1371. An effect which amounts to no more than one produced by merely running a program cannot count as a technical contribution. A patentable AI invention must therefore make a technical contribution beyond the mere manipulation, analysis, or the generation of textual data. UKIPO, Guidelines for examining patent applications relating to artificial intelligence (AI), paragraphs 5.41 and 5.44. This is determined by applying the four-step test established in the Court of Appeal's 2006 ruling which requires one to:

(i) properly construe the claim;

(ii) identify the actual contribution;

(iii) ask whether it falls solely within the excluded subject matter;

(iv) check whether the actual or alleged contribution is actually technical in nature.

A set of signposts are also regularly applied by U.K. courts to specifically analyze whether a claimed invention has a technical effect. AT&T Knowledge Ventures LP [2009] EWHC 343 (Pat) and *HTC Europe Co Ltd v. Apple Inc.* [2013] EWCA Civ 451. These signposts require one to consider:

(v) Whether the claimed technical effect has a technical effect on a process which is carried on outside the computer. The first signpost asks one to consider whether the AI invention produces an external technical effect. The new guidelines note that this may be evident in two different ways. See UKIPO, Guidelines for examining patent applications relating to artificial intelligence (AI), paragraph 5.2.

(vi) Whether the claimed technical effect operates at the level of the architecture of the computer; that is to say whether the effect is produced irrespective of the data being processed or the application being run. This signpost asks whether the AI invention results in a "better computer" because the computer which implements the invention generates an internal technical effect. The guidelines note that this may be evident in two different ways. See guidelines, paragraph 6.2.

(vii) Whether the claimed technical effect results in the computer being made to operate in a new way; Whether the program makes the computer a better computer in the sense of running more efficiently and effectively as a computer. This signpost asks whether the AI invention results in a "better computer" because the computer which implements the invention generates an internal technical effect. The guidelines note that this may be evident in two different ways. See guidelines, paragraph 6.2.

(viii) Whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented. This signpost asks whether the AI invention results in a "better computer" because the computer which implements the invention generates an internal technical effect. The guidelines note that this may be evident in two different ways. See guidelines, paragraph 6.2.