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**Datasheet for the decision
of 22 April 2026**

Case Number: T 0642/25 - 3.5.06

Application Number: 21728871.1

Publication Number: 3991099

IPC: G06N3/04, G06N3/08

Language of the proceedings: EN

Title of invention:

TRAINING A MACHINE LEARNING SYSTEM FOR TRANSACTION DATA
PROCESSING

Applicant:

Featurespace Limited

Headword:

Training set augmentation/FEATURESPACE

Relevant legal provisions:

EPC Art. 52(1), 56

Guidelines for examination G-II, 3.3.1

Keyword:

Inventive step - (no)

Decisions cited:

T 1194/97, T 0641/00, T 1901/08, T 1286/09, T 0755/18



Beschwerdekammern

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Case Number: T 0642/25 - 3.5.06

D E C I S I O N
of Technical Board of Appeal 3.5.06
of 22 April 2026

Appellant:

(Applicant)

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Decision under appeal:

**Decision of the Examining Division of the
European Patent Office posted/electronically
transmitted on 16 December 2024 refusing
European patent application No. 21728871.1
pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman

M. Müller

Members:

M. Domingo Vecchioni

A. Jimenez

Summary of Facts and Submissions

- I. The appeal is against the decision of the examining division to refuse the European patent application.
- II. The examining division refused the application on the basis that claim 1 of the main request and the auxiliary requests 1 to 3 then on file lacked an inventive step, Articles 52(1) and 56 EPC.

The examining division relied *inter alia* on the following prior art document in its reasoning:

D1: Longfei Li et al., "A time attention based fraud transaction detection framework", arXiv: 1912.11760v2 [cs.LG] 27 March 2020, XP081630473.

- III. With the statement of grounds of appeal, the appellant requested that the decision of the examining division be set aside and that a patent be granted on the basis of claims according to the main request underlying the contested decision, which were re-filed with the statement of grounds of appeal.
- IV. In a communication pursuant to Article 15(1) RPBA, the board presented its preliminary opinion on the appeal. Claim 1 of the main request appeared to lack an inventive step, Articles 52(1) and 56 EPC.
- V. With letter of 23 March 2026, the appellant filed a new set of claims as basis for an auxiliary request.
- VI. During the oral proceedings, the appellant withdrew its auxiliary request and maintained as its sole request the main request filed with their statement of grounds

of appeal. At the end of the oral proceedings, the chair announced the decision of the board.

VII. Claim 1 of the sole request on file reads as follows (itemisation by the board):

A computer implemented method (1000, 1200) of training a supervised machine learning system to detect anomalies within transaction data, the method comprising:

- (a) obtaining (1202) a training set (1010) of data samples (1012), each data sample being derived, at least in part, from transaction data and being associated with one of a set of uniquely identifiable entities, wherein at least a portion of the training set is unlabelled such that each data sample in the at least a portion of the training set does not have a label that indicates whether it relates to normal or anomalous behaviour;
- (b) assigning (1060, 1204) a label indicating an absence of an anomaly to unlabelled data samples in the training set;
- (c) partitioning (1020, 1206) the data of the data samples in the training set into two feature sets, a first feature set (1032) representing observable features and a second feature set (1034) representing context features, the observable features being derived from a function of at least transaction data for a current transaction, the context features being derived from one or more of a function of historical transaction data that excludes the

current transaction and retrieved data relating to the uniquely identifiable entity for the current transaction;

- (d) generating (1040, 1208) synthetic data samples (1050) by combining features from the two feature sets that respectively relate to two different ones of the set of uniquely identifiable entities such that the synthetic data samples comprise mixed pairs (1052, 1054) from the first and second set of features (1032, 1034);
- (e) assigning (1060, 1210) a label indicating a presence of an anomaly to the synthetic data samples;
- (f) augmenting (1212) the training set by combining the synthetic data samples with the data samples that have been labelled to indicate an absence of an anomaly; and
- (g) training (1214) the supervised machine learning system with the augmented training set and the assigned labels,
- (h) wherein the trained supervised machine learning system is configured to output a value indicative of a presence of an anomaly when supplied with a new data sample.

Reasons for the Decision

Background

1. The application relates to fraud detection in digital transaction data. A machine learning system is to be configured to produce, for a proposed transaction received as input, a value (e.g. a scalar value between 0 and 1) indicative of whether the proposed transaction represents an "anomaly", in the sense of not matching an expected pattern of behaviour based on past observations (paragraphs [0024] and [0043] of the published application).
2. A first part of the application concerns two specific architectures for such a machine learning system, illustrated in figures 6A to 6C and 7.

Claim 1 of the present request relates to the second part of the application, which concerns a method of *supervised training* of such a machine learning system on the basis of a training data set that is (at least in part) *unlabelled*. This method is described from paragraph [0103] onwards and illustrated in figures 9 to 12.

3. The proposed method essentially involves augmenting the training data set by
 - assigning a label indicating an absence of an anomaly to unlabelled data samples (feature (b) in claim 1 of the sole request on file), and
 - generating synthetic data samples, to which a label indicating a presence of an anomaly is assigned, by combining features from different data samples in the training set (features (c) to (f) in claim 1).

Inventive step

4. The examining division found that claim 1 lacked an inventive step, Articles 52(1) and 56 EPC.

The training method of claim 1 differed from that disclosed in D1 only in features that related to the training of a machine learning system to detect anomalous transactions.

The trained machine learning system was a mathematical method not serving any technical purpose. In particular, the classification of transactions was not a technical purpose in view of the EPO Guidelines G-II, 3.3.1. The training method, including the claimed augmentation of the training data set with synthetic data samples, was therefore also a mathematical method serving no technical purpose.

Furthermore, the claimed method was not adapted to a specific technical implementation in the sense of the EPO Guidelines G-II, 3.3.

The distinguishing features made therefore no technical contribution over D1 and could thus not justify the presence of an inventive step (contested decision, point 2).

5. The appellant's arguments focused on establishing that the distinguishing features identified by the examining division made a technical contribution (as the examining division had not argued that these features were otherwise obvious).

- 5.1 The fundamental problem underpinning the invention was that, on the one hand, *supervised* learning is generally

desirable as it resulted in a higher accuracy of classification (compared to unsupervised or semi-supervised learning), but, on the other hand, *labelled* data were often rare or entirely absent. This was particularly the case with transaction data, as there was little historical transaction data that had been labelled as being anomalous (statement of grounds of appeal, page 4; letter of 23 March 2026, point 3.1.2).

- 5.2 The invention solved the technical problem of "ensuring highly accurate machine learning systems in contexts where there is a paucity or absence of labelled training data" (statement of grounds of appeal, page 5).

In support of the technicality of this problem, the appellant argued the following: "Simply put, completing a task (i.e. producing an accurate model) without the resources conventionally considered as required to complete that task (i.e. labelled data) is a technical issue. The absence of suitable training data is a fact that can be objectively established, and the problem that this gives rise to can both be objectively established and further be recognised as one that is technical" (statement of grounds of appeal, page 5; letter of 23 March 2026, points 3.1.2 and 3.3).

The distinguishing features had the technical effect of "producing a new, label rich data set (i.e. by creating labelled data)", which "can be used to train the supervised machine learning system for highly accurate classification" (statement of grounds of appeal, page 5).

This technical effect of the training method was independent of any subsequent use to which the trained

model may be put (letter of 23 March 2026, point 3.1.2).

- 5.3 Furthermore, "creating new (i.e. synthetic) data [...] is, in itself, technical, and that remains true irrespective of whether non-technical means (e.g. a mathematical method) underpin the creation of that data or the data relates to non-technical matter". That is so because "[i]t is technically determinable, in the context of a computer implemented invention, whether new data has been created or not" (statement of grounds of appeal, page 6; letter of 23 March 2026, point 3.4).

Hence, both the problem and the solution were technical by nature (statement of grounds of appeal, page 6).

- 5.4 The appellant referred to decision T 1286/09 Image classifier/INTELLECTUAL VENTURES as one in which the generation of synthetic training data for the purpose of training a classifier was found to constitute the core of a patentable invention, without discussing whether, let alone disputing that, such generation was technical (statement of grounds of appeal, pages 6 and 7).

At the oral proceedings, the appellant argued that there was no fundamental difference between the digital images being classified in T 1286/09 and the transactions being classified in the present case, as both were represented by numerical arrays.

- 5.5 The appellant also referred to the passage of the EPO Guidelines G-II, 3.3.1,

"Where a classification method serves a technical purpose, the steps of generating the training set and

training the classifier may also contribute to the invention's technical character if they help to achieve that technical purpose",

and stated that it was to be understood as implying that "if a classifier serves a technical purpose then, to the extent training of the classifier/generation of training data for that classifier contributes to the *same* technical purpose, the training/generation aspects may be independently patentable *irrespective of whether the training/generation aspects themselves provide an independent technical contribution that is distinct from that provided by the classifier*" (emphasis by the appellant) (statement of grounds of appeal, paragraph bridging pages 7 and 8).

Furthermore, the cited passage of the EPO Guidelines set out a *sufficient* condition for the training steps to inherit technical character from the classifier, it did not purport to establish a *necessary* condition (letter of 23 March 2026, point 3.5).

5.6 At the oral proceedings, the appellant also argued that the labels that were generated represented "functional data" and thus made a technical contribution.

5.7 Finally, the appellant argued that the claimed invention "does not relate itself to the classification of a transaction as expected or anomalous", but to "training a technical system that is capable of more accurately conducting such a classification".

The fact that determining whether a financial transaction was anomalous may be of business relevance did not detract from the technical nature of the training/generation of data or the system itself. The

appellant referred to decision T 1901/08 as one in which "it was decided that a technical system (i.e. the self-service terminal/ automated teller machine) remained a patentable invention with the meaning of the EPC even when the purpose of that system was to detect financial fraud" (statement of grounds of appeal, pages 6 and 7; letter of 23 March 2026, point 3.6).

Allowing for supervised learning of a machine learning system to be conducted where otherwise that would not have been possible was technical irrespective of the specific context (i.e. financial transaction anomaly detection) in which it was claimed (statement of grounds of appeal, page 7).

6. The board considers that claim 1 lacks an inventive step, Articles 52(1) and 56 EPC, essentially for the same reasons as those given by the examining division.
- 6.1 The reference to D1 however appears unnecessary, as the claimed method does not have any technical character beyond its execution on a computer - which may be a conventional general-purpose computer system. Features making no technical contribution cannot justify the presence of an inventive step (T 641/00 Two identities/ COMVIK, headnote I).
- 6.2 The method carried out by the computer comprises two parts:
 - generating an augmented, labelled training set from an unlabelled training set of transaction data (features (a) to (f)), and
 - training a "supervised machine learning system" with the generated augmented and labelled training set so as to configure it to output a value indicative of a

presence of an anomaly when supplied with a new transaction (features (g) and (h)).

- 6.3 It is not apparent that any technical effect is produced, or implied, by this method.

As regards the first part, both the initial training set and the generated augmented training set constitute only abstract data. Transaction data, which may be payment data, have no inherent technical character.

As regards the second part, the trained "supervised machine learning system" may be a computer program. Determining whether a (financial) transaction presents an "anomaly" is not per se a technical problem. Hence, it is not apparent that the trained supervised machine learning system, when used to measure a degree of anomaly for a given transaction, produces any "further technical effect". In particular, no technical effect is implied by the fact that the system has been trained with the augmented, labelled training set. Consequently, the "trained supervised machine learning system" has no technical character and, hence, its production does not represent or imply a technical effect.

It thus also follows that the augmented, labelled training set generated in the first part does not contribute to the production of a technical effect in the context of the claimed method.

6.4 The board is not convinced by the appellant's arguments.

6.4.1 Re points 5.1, 5.2 and 5.6 above:

Neither a machine learning model (or "system") nor the training (be it supervised or not) of such a model has per se a technical character. In the present case, the trained machine learning model serves the purpose of determining the likelihood that a transaction is an anomalous one, which is not a technical purpose. Consequently, achieving this purpose at a high degree of accuracy is not a technical problem (see e.g. T 755/18 Semi-automatic answering/3M INNOVATIVE PROPERTIES, catchword).

In the present case, the training data are abstract data. The non-availability in practice of labelled training data - even if it can be "objectively established" - may be a *practical* problem but is not per se a *technical* one.

Similarly, the generated training data, including their labels, are abstract data. The labels represent cognitive information about the training data, not "functional data" in the sense of T 1194/97 Data structure product/PHILIPS. Hence, the generation of labelled training data does not represent per se a technical effect.

It follows that the board does not consider the problem formulated by the appellant ("ensuring highly accurate machine learning systems in contexts where there is a paucity or absence of labelled training data") to be a technical problem.

6.4.2 Re point 5.3 above:

If the appellant's argument were to be followed, all computer programs would make a technical contribution as their outputs are "technically determinable", but that would be in contradiction with Article 52(2)(c) EPC.

6.4.3 Re points 5.4 and 5.5 above:

Apart from the fact that the EPO Guidelines are not binding on the boards of appeal, the quoted passage of the EPO Guidelines G-II, 3.3.1 does not apply to claim 1 as the present "supervised machine learning system" does not represent "a classification method serv[ing] a technical purpose", for the reasons given above.

T 1286/09 concerned the training of a semantic digital image classifier using an augmented training set ("expanded training set") generated from a training image ("exemplar color image") by applying various digital image transformations to it ("systematically altering the exemplar color image") that do not change its semantic content. This might be considered to correspond to the situation addressed in the cited passage of the EPO Guidelines.

Furthermore, in that case, the image transformations applied to a digital image rely on the digital representation of that image (see e.g. "systematically shifting the color distribution of the exemplar color image" in claim 1 in T 1286/09). This is not the case in the present invention.

The board tends to believe - but cannot definitely know - that the above considerations led the board in T 1286/09 not to question that a technical contribution was made. At least, however, they clearly distinguish the invention in T 1286/09 from the present one so that no definite conclusions can be drawn from T 1286/09 for the case at hand.

6.4.4 Re point 5.7 above:

The board generally agrees with the appellant - and in that respect with T 1901/08 - that the fact that an invention serves a business aim does not, in and of itself, render its features non-technical. However, if a feature is per se non-technical and the *only* effects it contributes to are business-related effects, then this feature makes no technical contribution.

6.5 Hence, the computer on which the claimed method is implemented may be a conventional general-purpose computer system, and the method steps carried out by this computer make no technical contribution. The method of claim 1 lacks therefore an inventive step in the sense of Article 56 EPC.

7. In its preliminary opinion (point 13), the board additionally expressed doubts that the claimed method actually solved the problem formulated by the appellant (see point 5.2 above) over the whole scope of the claim, but this issue was ultimately left open.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



L. Stridde

Martin Müller

Decision electronically authenticated