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**Datasheet for the decision
of 1 April 2022**

Case Number: T 1191/19 - 3.5.05

Application Number: 08877672.9

Publication Number: 2351523

IPC: G06F19/00, A61B5/16

Language of the proceedings: EN

Title of invention:

METHOD AND SYSTEM TO SAFELY GUIDE INTERVENTIONS IN PROCEDURES
THE SUBSTRATE WHEREOF IS NEURONAL PLASTICITY

Applicant:

Fundació Institut Guttmann

Headword:

Neuronal plasticity/INSTITUTGUTTMANN

Relevant legal provisions:

RPBA 2020 Art. 12(3)(a)

RPBA Art. 12(4)

EPC Art. 84, 56, 83

Keyword:

Late-filed evidence - documents could have been filed in first instance proceedings (yes) - admitted (no)

Inventive step - (no)

Sufficiency of disclosure - (no)

Decisions cited:

T 0161/18



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Case Number: T 1191/19 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 1 April 2022

Appellant: Fundació Institut Guttmann
(Applicant) Camí de Can Ruti s/n
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 7 December 2018
refusing European patent application No.
08877672.9 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair A. Ritzka
Members: E. Konak
F. Blumer

Summary of Facts and Submissions

I. The appeal is against the examining division's decision to refuse the application. The examining division decided that claims 1 to 6 did not meet the requirements of, *inter alia*, Articles 84 and 56 EPC. The objection under Article 56 EPC was based on the following documents:

D1: Gibert et al., "Response to traumatic brain injury neurorehabilitation through an artificial intelligence and statistics hybrid knowledge discovery from databases methodology", *Medicinsky Arhiv*, Sarajevo, vol. 63, no. 3, June 2008, 132-5

D11: WO 2007/079181

II. With its statement setting out the grounds of appeal, the appellant filed an amended main request which corresponds to the sole request on which the contested decision is based except for minor amendments to claim 6. It requested that the decision be set aside, that a patent be granted on the basis of the main request, and oral proceedings as an auxiliary measure.

The appellant further filed the following documents:

AX1: Prodromidis, et al. "Meta-learning in distributed data mining systems: Issues and approaches"

AX2: Wang, "Encyclopedia of Data Warehousing and Mining", 2nd edn., vol. III, 1207-15

AX3: Vilalta et al., "A Perspective View And Survey Of Meta-Learning"

AX4: Seewald, "Meta-Learning for Stacked Classification"

AX5: Vilalta et al., "Meta-learning Concepts and Techniques"

AX5bis: Maimon et al., "Data Mining and Knowledge Discovery Handbook"

AX6: Giraud-Carrier et al., "Introduction to the Special Issue on Meta-Learning"

AX7: Zenko et al., "Stacking with an Extended Set of Meta-level Attributes and MLR"

AX8: Han et al., "Data Mining Concepts and Techniques", 3rd edn.

III. In a communication pursuant to Article 15(1) RPBA, dated 16 December 2021, the board communicated that it was minded not to admit AX2 to AX8 and raised objections under Articles 56 and 83 EPC against the main request.

IV. With a letter dated 30 March 2022, the appellant withdrew its request for oral proceedings and requested a partial reimbursement of the appeal fee in accordance with Rule 103 EPC. It further submitted the following list of additional prior-art documents but did not file the documents mentioned in the list:

" "Active Mining - New Directions of Data Mining (Frontiers in Artificial Intelligence and Applications, Knowl)". Hiroshi Motoda. Published July 29, 2002.

"Using Meta-Learning to Support Data Mining".
Vilalta, R., et al. 2004. *Int. J. Comput. Sci. Appl.*,
1, 31-45.

"A Perspective View and Survey of Meta-Learning".
Vilalta, R., Drissi, Y. 2002. *Using Meta-Learning to
Support Data Mining. Int. J. Comput. Sci. Appl.*, 1, 31-
45.

*"On the Accuracy of Meta-Learning for Scalable Data
Mining"*. Chan Philip, K. & Stolfo, S. 1997. In
Kerschberg, L. (ed.) *Journal of Intelligent Integration
of Information*

*"The Use of Meta-Level Information in Learning
Situation-Specific Coordination"*. Prasad, M. V.
Nagendra & Lesser Victor, R. 1997. *Proceedings of the
Fifteenth International Joint Conference on Artificial
Intelligence. Nagoya, Japan."*

V. The scheduled oral proceedings were thus cancelled.

VI. Claim 1 of the main request reads as follows:

"A computer-implemented method for optimizing predictions for personalized interventions for a determined user in processes the substrate of which is the neuronal plasticity, including one of a neurorehabilitation process, a neuroeducation/neurolearning process and a cognitive neurostimulation process, where said interventions comprise at least cognitive and/or functional tasks to be performed by said determined user or subject of said neurorehabilitation, of said neuroeducation/neurolearning or of said cognitive neurostimulation, wherein the method comprises:

- generating and using a database with information regarding a plurality of users at least in relation to interventions to be performed or to which to be

subjected and to the users responses to the performance of said interventions,
said method being **characterized in that** said information includes evolutionary variables comprising information in relation to the success of each user been subjected to one or more of such interventions, and in that the method further comprises:

- receiving, by a central computer server (5), a request for a prediction in relation to an intervention for said determined user from at least one therapist computer terminal (8) in remote communication with the central computer server (5);

- upon reception of said request, the central computer server (5) accessing said database (6), wherein if the determined user not being a user of the plurality of users, data with information regarding the determined user is introduced in the database (6);

- using, by the central computer server (5), an algorithm or strategy in the field of meta-learning for automatically performing the following steps:

- a) generating at least two groups of candidate predictions related to possible interventions to be performed or to which the determined user is to be subjected by performing at least two steps of classification learnt in a set of validation data independent and common for both steps of classification, said at least two steps of classification being carried out independently on the information of said database by means of:

- al) using two classifiers differentiated from one another at least in that each of them is based on applying a respective set of heuristic or deterministic rules different from that of the other classifier to obtain said at least two groups of candidate predictions which are different from one another, or

a2) using a single classifier based on a single set of heuristic or deterministic rules, said classifier being used at least twice, once for each step of classification with different input parameters every time,

said information of the database being considered as constituent of some basic training data;

b) generating from said validation data and said two groups of candidate predictions a set of training data in meta-level;

c) performing a meta-classification based on at least heuristic or deterministic rules on said set of training data in meta-level, for integrating the two classifiers or for improving the performance of each of them independently,

said classification of step a) and meta-classification of step c) being carried out by means of:

- artificial neural networks, wherein said input parameters being at least related to one of the following characteristics of an artificial neural network: network topology, activation function, end condition, learning mechanism, or to a combination thereof, or

- automatic inductive learning algorithms,

and

d) based on the results of said step c), determining a final or optimum prediction by selecting one of said groups of candidate predictions obtained in step a) or by combining them to one another, and:

- d1) selecting the classifier and heuristic or deterministic rules used in sub-step a1) which have caused said final or optimum prediction; or

- d2) selecting the input parameters of said single classifier used in sub-step a2) which have caused said final or optimum prediction,

wherein said final or optimum prediction refers to a percentage of success of applying the intervention to the determined user, said percentage being depicted by means of the evolutionary variables and incorporating new values of the evolutionary variables for the determined user in the database (6), and said success being analyzed at at least one of the following four levels:

- success at level of execution of the cognitive and/or functional task and of the suitability or adequacy of the task proposed for each specific profile of user;

- success at level of achievement of the immediate objective which is understood as an improvement in the cognitive function for which the cognitive and/or functional task has been selected;

- success at level of achievement of the generic objective which is understood as objectified improvements at other cognitive functions in addition to the target function; and

- success at level of achievement of the long term objective which is understood as a reduction of the functional limitations for the development of daily activities in the case of a neurorehabilitation process, or which is understood as the achievement of a certain degree of neurolearning in the case of a neuroeducation/ neurolearning process, or which is understood as an improvement in the stimulated cognitive capacities in the case of cognitive neurostimulation;

- supplying, by the central computer server (5) to the therapist computer terminal (8) the final or optimum prediction, in order the latter deciding whether the cognitive and/or functional tasks included in the intervention for the determined user being maintained or modified;

- sending, by the central computer server (5), to the determined user via a user computer terminal (7a, 7b, 7c) in two-way communication with said central computer server (5) the intervention decided by the therapist based on said decision; and

- receiving, by the central computer server, the results of performing said intervention from the user."

Reasons for the Decision

1. Admissibility of AX1 to AX8 and the list of documents received on 30 March 2022
 - 1.1 In the annex to its statement setting out the grounds of appeal, the appellant filed several scientific publications and textbooks, AX1 to AX8, to argue that the objections under Article 84 EPC in the contested decision were not justified. With the exception of AX1, which was filed prior to the oral proceedings before the examining division, these documents were never presented during the examining proceedings, although objections under Article 84 EPC had been raised in every single official communication.
 - 1.2 In accordance with Article 12(4) RPBA 2007, the board has discretion not to admit evidence which could have been presented in the examination proceedings. Since documents AX2 to AX8 could and should have been presented in the examination proceedings, the board informed the appellant that it was minded not to admit them into the appeal proceedings.
 - 1.3 The appellant wrote in reply that these documents proved that the objections under Article 84 EPC in the contested decision were incorrect. However, the

appellant did not address the crucial question of why these documents had not been presented in the examination proceedings. Under these circumstances, the board sees no reason to change its preliminary opinion and does not admit AX2 to AX8 into the appeal proceedings (Article 12(4) RPBA 2007).

1.4 The appellant also included in its letter of reply a list with "a recompilation of additional prior art documents" (see IV above) "to further show that the claims and specification fully comply with Articles 83 and 84 EPC". It added that the documents in the list "clearly show that at the date of filing the present patent application, in 2008, the field of meta-learning was well-know [sic]". However, since the appellant did not present copies of the documents in the list, these documents are not part of the appellant's appeal case (Article 12(3)(a) RPBA 2020). Moreover, since the appellant did not substantiate how the documents in its list show what they allegedly show, this list and any document it might refer to cannot be considered.

2. Clarity (Article 84 EPC)

2.1 The contested decision objected to some terms in claim 1 as being unclear. The examining division was not convinced by the appellant's argument that these terms indeed had established meanings in the relevant art and did not accept AX1 as evidence of common general knowledge in this regard. In its statement setting out the grounds of appeal, the appellant referred again to AX1, in particular to Figure 1 (which is almost identical to Figure 1 of the application at hand) and section 2.2, and submitted that the invention used the general meta-learning scheme disclosed in AX1.

- 2.2 Given that claim 1 indeed uses the same terminology as AX1, which the board prefers as the starting point to assess inventive step, it can be left open whether claim 1 meets the requirements of Article 84 EPC.
3. Inventive step (Article 56 EPC)
- 3.1 In the contested decision, claim 1 was found not to involve an inventive step with regard to document D1 in combination with document D11. However, in view of the appellant's submission that the invention uses the same general meta-learning scheme as disclosed in AX1, the board considers AX1 to be a more appropriate starting point for assessing inventive step.
- 3.2 In its statement setting out the grounds of appeal, the appellant argued that applying meta-learning to model and guide processes related to brain plasticity was a novel and inventive strategy. However, the mere application of a known machine learning technique to problems in a particular field is a general trend in technology (see T 161/18, point 3.6 of the Reasons) and cannot be inventive as such. Therefore, the board informed the appellant in its preliminary opinion that it had to be assessed whether the method of claim 1 applied the meta-learning scheme of AX1 to the specific problem at hand, namely predicting personalised interventions for a patient in processes of which the substrate is neuronal plasticity, in a manner which would not have been obvious to the skilled person. The board could not see in the method of claim 1 any non-obvious detail of the application of the meta-learning scheme of AX1 to the problem at hand beyond a mere reiteration at an abstract level of the scheme disclosed in AX1.

3.3 Since the appellant did not reply to the board's inventive-step objection, the board sees no reason to change its preliminary opinion. Therefore, the subject-matter of claim 1 does not involve any inventive step (Article 56 EPC).

4. Sufficiency of disclosure (Article 83 EPC)

4.1 Furthermore, the application does not disclose how the meta-learning scheme of AX1 was applied to the problem at hand in a manner sufficiently clear and complete for it to be carried out by the person skilled in the art. Using the terminology in Figure 1 and the description, the application does not disclose any example set of training data ("database with information regarding a plurality of users at least in relation to interventions to be performed" in claim 1) and validation data (also "validation data" in claim 1), which the meta-learning scheme requires as input. The application does not even disclose the minimum number of patients from which training data should be compiled to be able to give a meaningful prediction and the set of relevant parameters. The Heuristic Bases A and B for training Classifiers A and B ("a respective set of heuristic or deterministic rules different from that of the other classifier" in step a1 of claim 1) and the Meta Heuristic for training the Meta Classifier ("[meta-classification based on] at least heuristic or deterministic rules" in step c of claim 1) for the solution of the problem at hand are likewise not disclosed, nor is the structure of the artificial neural networks used as classifiers, their topology, activation functions, end conditions or learning mechanism (see also T 161/18, point 2 of the Reasons). At the level of abstraction of the application, the

available disclosure is more like an invitation to a research programme.

4.2 Under these circumstances, the skilled person cannot reproduce without undue burden the application of the meta-learning scheme of AX1 to solve the problem of predicting personalised interventions for a patient in processes the substrate of which is neuronal plasticity.

4.3 The board raised these objections in its preliminary opinion. Since the appellant did not address them in its letter of reply, the board sees no reason to change its preliminary opinion. Therefore, the application does not meet the requirements of Article 83 EPC.

5. Request for partial reimbursement of the appeal fee

5.1 In accordance with Rule 103(4)(c) EPC, the appeal fee must be reimbursed at 25% if any request for oral proceedings is withdrawn within one month of notification of the communication issued by the board in preparation for the oral proceedings and no oral proceedings take place.

5.2 In this case, the communication in preparation for oral proceedings was dispatched on 16 December 2021 and thus deemed to be notified on 26 December 2021. The one-month time limit ended on 26 January 2022. The withdrawal of the request for oral proceedings was received on 30 March 2022, i.e. after the time limit established in Rule 103(4)(c) EPC. Thus, the request for partial reimbursement of the appeal fee is rejected.

Order

For these reasons it is decided that:

1. The appeal is dismissed.
2. The request for partial reimbursement of the appeal fee is rejected.

The Registrar:

The Chair:



D. Hampe

A. Ritzka

Decision electronically authenticated