Intellectual Property Office

BL O/0706/23

24 July 2023

PATENTS ACT 1977

APPLICANT	Prevayl Innovations Limited
ISSUE	Whether patent application GB 1916652.9 complies with section 1(2) of the Patents Act 1977
HEARING OFFICER	J Pullen

DECISION

1 Patent application GB 1916652.9, entitled "Method and electronics arrangement for a wearable article", was filed 15 November 2019. It was published as GB 2588951 A on 19 May 2021.

2 The examiner raised novelty and inventive step objections based upon various prior disclosures in the combined search and examination report, dated 18 May 2020. The applicant amended the specification in order to overcome these objections. A further examination report was issued with further objections to novelty and inventive step, plus an objection to the invention as being excluded under section 1(2) of the Patents Act 1977 ("the Act") as a program for a computer as such. There have then been several rounds of correspondence between the examiner and the applicant without agreement being reached as to a form of claims which would overcome the excluded subject matter objection, though the novelty and inventive step objections have fallen away through amendment.

3 A hearing was offered in the examination report of 12 December 2022. In response, the applicant filed a request for a decision on the papers in their letter of 28 March 2023. The examiner then issued a pre-hearing report on 15 May 2023 and indicated that the issue to be decided is whether the invention is excluded as a program for a computer as such. No further submissions from the applicant have been received.

4 I note that the compliance date for the application is 15 May 2024.

5 I confirm that in reaching my decision I have considered all documents on file, particularly the amended claims and submissions filed 12 October 2022 and submissions filed in the letter of 28 March 2023.

The invention

6 The "Background" section of the description recites:

"Wearable articles comprise sensors to measure properties such as the physiological, psychological, biochemical, environmental and behavioural traits of a user wearing the wearable device. The data sensed by the wearable articles are used in machine-learning applications and in particular to train models for recognizing properties of the user and/or the activities the user is undertaking. To train machine-learned models from data sensed by a number of wearable articles, it is conventionally required that the wearable articles all transmit data to a central server. The central server has the computational resources to train machine-learned models using large data sets received from many wearable articles.

One problem with this approach is that it requires potentially sensitive data to be transmitted to and held at a central server. This can present potential privacy and security issues especially if the central server is compromised or run by an untrustworthy entity. Moreover, many people may be uncomfortable with sharing their sensitive data with the central server and thus may be reluctant to use such wearable articles. This reduces the amount of data available for training machine-learned models and thus may reduce the accuracy of any resultant models trained on the central server. This is particularly problematic when models are trained for generating inferences that will have a positive effect on individuals by providing inferences related to their health, lifestyle, fitness and performance.

It is an object of the present disclosure, to provide machine-learning functionality for wearable articles that allows for machine-learned models to be trained from data sensed by a number of different wearable articles without requiring the data to be transmitted to a central server."

7 The detailed description sets out various embodiments in which sensor data is collected from a user and then processed to provide a physiological classification using the data. The sensor data is obtained via a wearable article. The data is then processed and a machine-learned model is used to generate the physiological classification. It is then determined if the machine-learned model should be updated. If the model is updated, data related to the new machine-learned model is transmitted to an external computer. The external computer performs an updating process on the model and the updated physiological classification model is returned.

8 In an embodiment of the invention a base station is provided in addition to the wearable device and a server, which is a remote server. Local model updates can be undertaken at either the wearable article or the base station and either of the wearable device or the base station can communicate with the server.

9 The current claim set, as filed on 12 October 2022, comprises two fully independent claims as follows:

> 1. A method performed by an electronics arrangement for a wearable article, the method comprising the following steps:
> (a) obtaining a current version of a machine-learned model for performing physiological classification;
> (b) obtaining first data comprising physiological data from at least one sensor of the wearable article;
> (c) employing the current version of the machine-learned model to generate a physiological classification using the first data;
> (d) determining whether to update the current version of the machine-learned model by comparing a confidence level of the generated physiological classification to a first predetermined threshold, wherein if the confidence level of the generated

physiological classification is greater than or equal to the first predetermined threshold, the method further comprises:
(e) updating the current version of the machine-learned model using the first data obtained from the wearable article;
(f) transmitting updated machine-learned model data to an external computer apparatus; and
(g) receiving an updated machine-learned model for performing physiological classification from the external computer apparatus, the updated machine-learned model being generated from the updated machine-learned model data.

18. A system comprising:
an electronics arrangement comprising at least one processor and at least one memory storing instructions, the instructions, when executed by the processor, cause the processor to perform operations, the operations comprising:
(a) obtaining a current version of a machine-learned model for performing physiological classification;
(b) obtaining first data comprising physiological data from at least one sensor of the wearable article;
(c) employing the current version of the machine-learned model to generate a physiological classification using the first data;
(d) determining whether to update the current version of the machine-learned model by comparing a confidence level of the generated physiological classification to a first predetermined threshold; and
(e) if the confidence level of the generated physiological classification is greater than or equal to the first predetermined threshold, updating the current version of the machine-learned model using the first data obtained from the wearable article, and transmitting updated machine-learned model data to a server; and
a server comprising at least one processor and at least one memory storing instructions, the instructions, when executed by the processor, cause the processor to perform operations, the operations comprising:
(f) obtaining the updated machine-learned model data from the electronics arrangement;
(g) generate an updated machine-learned model for physiological classification from the updated machine-learned model data; and
(h) transmitting the updated machine-learned model to the electronics arrangement.

10 It is noted that there are additional claims to an electronics arrangement for a wearable article to perform the method and also to a wearable article comprising that electronics arrangement. The claims, as they are currently set out, will stand or fall together.

The issue to be decided

11 The issue to be decided is whether the claimed invention relates to excluded subject matter, and in particular whether the invention falls into the category of section 1(2)(c) of the Patents Act 1977 as a program for a computer as such.

The law

12 The examiner has raised an objection based upon the fact that the invention is excluded from being patented as a program for a computer, as such. The relevant section of the Act is s.1(2), the most relevant provision of which is shown below with my emphasis added:

1(2) It is hereby declared that the following (among other things) are not inventions for the purposes of this Act, that is to say, anything which consists of-

(a) ...;
(b) ...;
*(c) … **or a program for a computer**;*
(d) ...;

*but the foregoing provision shall prevent anything from being treated as an invention for the purposes of this Act only to the extent that **a patent or application for a patent relates to that thing as such.***

13 The Court of Appeal has said that the issue of whether an invention relates to subject matter excluded by Section 1(2) must be decided by answering the question of whether the invention reveals a technical contribution to the state of the art. The Court of Appeal in *Aerotel/Macrossan*[1] set out the following four-step approach to help decide the issue:

(1) Properly construe the claim;

(2) Identify the actual contribution;

(3) Ask whether it falls solely within the excluded subject matter;

(4) Check whether the actual or alleged contribution is actually technical in nature.

14 The operation of the approach is explained at paragraphs 40-48 of the judgment. Paragraph 43 confirms that identification of the contribution is an exercise in judgment involving the problem said to be solved, how the invention works and what its advantages are; essentially, what it is the inventor has really added to human knowledge, looking at substance, not form. Paragraph 47 adds that a contribution which consists solely of excluded matter will not count as a technical contribution.

15 In *Symbian*[2] the Court of Appeal reaffirmed the *Aerotel* approach while considering a question of "technical contribution" as it related to computer programs emphasising the need to look at the practical reality of what the program achieved, and to ask whether there was something more than just a "better program".

16 The case law on computer implemented inventions was further elaborated in *AT&T/CVON*[3] (*AT&T*) which provided five helpful signposts to apply when considering whether a computer program makes a relevant technical contribution. In *HTC v Apple*[4], Lewison LJ reconsidered the fourth of these signposts and felt that it expressed too restrictively. The signposts are:

i. whether the claimed technical effect has a technical effect on a process which is carried on outside the computer;
ii. 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 applications being run;

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[1] *Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application* [2006] EWCA Civ 1371; [2007] RPC 7
[2] *Symbian Ltd v Comptroller-General of Patents*, [2009] RPC 1
[3] *AT&T Knowledge Ventures/Cvon Ltd* [2009] EWHC 343 (Pat)
[4] *HTC Europe Co Ltd v Apple Inc* [2013] EWCA Civ 451

iii. whether the claimed technical effect results in the computer being made to operate in a new way;
iv. whether the program makes the computer a better computer in the sense of running more efficiently and effectively as a computer;
v. whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented.

17 I must bear in mind that the signposts are mere guidelines for a technical contribution and should not be applied in a prescriptive manner. I also note that the paragraph after signposts in the *AT&T* judgment cautions me to consider if the claimed technical effect lies solely in excluded matter if I decide that there is a technical effect based upon the signposts. I must decide whether the claimed invention makes a technical contribution when considered on its own merits.

Assessment

(1) Properly construe the claim

18 In the pre-hearing report, the examiner has identified a single point of construction worthy of comment – that the electronic arrangement of both claims 1 and 18 is any computing device for communicating with, or integrating with, a wearable device. I interpret this to mean that the electronic arrangement is either part of the wearable device or may be part of a device separate from a wearable device, such as a local "base station" as found in the description.

19 Also, I believe there are several other points that require consideration. Beginning with the nature of the wearable article, the description as filed states, starting at page 4, line 31:

"The wearable article may be any form of electronic device which may be worn by a user such as a smart watch, necklace, bracelet, or glasses. The wearable article may be a textile article.

The wearable article may be a garment. The garment may refer to an item of clothing or apparel. The garment may be a top. The top may be a shirt, t-shirt, blouse, sweater, jacket/coat, or vest. The garment may be a dress, brassiere, shorts, pants, arm or leg sleeve, vest, jacket/coat, glove, armband, underwear, headband, hat/cap, collar, wristband, stocking, sock, or shoe, athletic clothing, swimwear, wetsuit or drysuit. The wearable article/garment may be constructed from a woven or a non-woven material. The wearable article/garment may be constructed from natural fibres, synthetic fibres, or a natural fibre blended with one or more other materials which can be natural or synthetic. … The garment may be a tight-fitting garment. Beneficially, a tight-fitting garment helps ensure that any sensors of the garment are held in contact with or in the proximity of a skin surface of the wearer. The garment may be a compression garment. The garment may be an athletic garment such as an elastomeric athletic garment."

20 Then starting at page 9, line 28 of the description as filed it is stated:

"The present disclosure is not limited to wearable articles and instead may be applied to other forms of devices such as non-wearable textile articles. Such textile articles may include upholstery, such as upholstery that may be positioned on pieces of furniture, vehicle seating, a wall or ceiling decor, among other examples."

21 This second paragraph puts some doubt on the nature of the “wearable article”. However, I should be cautious against using stray phrases in the body of the specification to construe the claim in a manner contrary to the plain words of the claim. Therefore, I am satisfied that the term “wearable article” does indeed mean a “wearable article” and that the claimed invention requires that the electronics arrangement is suitable for use with an article that is worn by a user.

22 The wearable article has at least one sensor, which is used to obtain “physiological data”. There is no definition in the description with respect to the meaning of this term, so given that a dictionary definition of “physiology” is that it is the study of the functions and processes of living organisms, I take “physiological data” to mean data related to the functions and processes of the wearer.

23 The nature of the sensor is also discussed. The sensor is said to include “at least one of an optical sensor, force sensor, electrical sensor and temperature sensor, acoustic sensor” at page 3, lines 33-34 of the description as filed.

24 Section (a) of claims 1 and 18 requires that a current version of a machine-learned model for obtaining physiological classification is obtained. The only method of obtaining the current version of the machine-learned model is for it to be received from an external computing apparatus.

25 The machine-learned model is said to be or include one or more of a number of conventional types of machine-learned models, such as artificial neural networks, Bayesian networks, support vectors machine techniques, Hidden Markov Models, and decision trees, for example, as found in the passage starting at page 27, line 1 of the description as filed. Therefore, the type of model used in the invention does not appear to be pertinent to the claimed invention.

26 The nature of the physiological classification is discussed at the description at page 3, lines 23-27:

> *“The physiological classification may relate to classifying the users [sic] cardiac state, respiratory state, stress levels, emotional state, fatigue, and for classifying whether the user is drowsy.”*

27 If the confidence of a generated physiological classification from first data is above a threshold, then the current version of the machine-learned model is updated using the first data. Data concerning the updated machine-learned model is transmitted from the electronics arrangement to an external computer apparatus, at least in claim 1. This means that the sensor data used to derive the updated machine-learned model is not sent to the external computer apparatus. Instead, the whole updated machine-learned model could be transmitted or data representing the updated machine-learned model or data representative of the local update to the machine-learned model could be sent.

28 In claim 18, the updated machine-learned model data is transmitted to a server rather than an “external computer apparatus”. It should be noted that the only external computing apparatus found in the description is a server, so there is no difference in the meaning of the two claims.

29 In both claims 1 and 18 the electronics arrangement explicitly (claim 1) or implicitly (claim 18) receives an updated machine-learned model for performing physiological classification from the external computer apparatus.

30 In claim 18 the nature and the functions of the server are defined, as given above.

31 It is not clear in either claim 1 or claim 18 what the purpose of the update undertaken by the external computer apparatus is, or how the external computer apparatus updates the machine-learned model. The description states that the server-based model update is part of a federated learning approach in which updated machine-learned model data is obtained from multiple electronic arrangements and the server (or other external computing apparatus) uses the data from the multiple local updates to generate an updated machine-learned model that reflects the updates generated by the electronics arrangements. This can be found in the description on page 15, lines 26-33 & page 21, lines 1-28, for example. However, in the invention defined in both claims 1 and 18, no other updated machine-learned model data is obtained apart from that received from the single electronics arrangement that is part of the claim. Given that this electronics arrangement has already updated its model, in part (e) of both claims, and no other updated machine-learned model data is received, the update to the machine-learned model at the server appears redundant. This is a clarity or conciseness issue which will require addressing should I find in favour of the applicant.

32 In light of this, I am minded to construe the claims as requiring that the update to the machine-learned model at the server / external computing apparatus to be based upon updated machine-learned model data from multiple electronic arrangements, as I think this is what is intended given the background of the invention, and the embodiments of the invention described with reference to Figures 4, 5 and 10 in particular.

33 It should be noted that the wearable article itself is not necessarily part of the invention, with the functions of the electronics arrangement being carried out at a base station – an electronic device that is capable of communicating with the server and a wearable device. In one embodiment the base station could be a further wearable device such as a smart watch, but could be a smartphone, a tablet computer, a docking station for a wearable device, a gaming system or a point-of-sale device, for example. Other devices that may function as a base station are mentioned at page 16, line 32 to page 17, line 21.

34 Given the considerations above, claim 1 should be construed as:

A method performed by an electronics arrangement for a wearable article, the method comprising the following steps:
(a) obtaining a current version of a machine-learned model for performing physiological classification;
(b) obtaining first data comprising physiological data from at least one sensor of the wearable article;
(c) employing the current version of the machine-learned model to generate a physiological classification using the first data;
(d) determining whether to update the current version of the machine-learned model by comparing a confidence level of the generated physiological classification to a

first predetermined threshold, wherein if the confidence level of the generated physiological classification is greater than or equal to the first predetermined threshold, the method further comprises:
(e) updating the current version of the machine-learned model using the first data obtained from the wearable article;
(f) transmitting updated machine-learned model data to an external computer apparatus; and
(g) receiving an updated machine-learned model for performing physiological classification from the external computer apparatus, the received updated machine-learned model being generated at the external computer apparatus from the updated machine-learned model data of multiple electronics arrangements.

35 Claim 18 is construed in a similar fashion.

(2) Identify the actual or alleged contribution

36 In the applicant's latest letter, dated 28 March 2023, there is no submission regarding the contribution that the invention makes. However, in previous letters, dated 11 July 2022 & 12 October 2022, there are submissions regarding the contribution that the invention makes.

37 In their letter of 11 July 2022, the applicant states that:

> *"The contribution of the invention is an improved method of operating an electronics arrangement for a wearable article while participating in global training of machine learned models that allows for enhanced data security and reduced power consumption."*

38 I am not convinced that this is an accurate representation of the actual contribution that the present invention makes since it encompasses the benefits and advantages of federated learning. Federated learning was known in the art before the date of the invention, as is acknowledged in the description as filed at page 11, lines 25-27 and page 21, lines 19-21:

> *"The present disclosure therefore enables a federated learning approach that has been particularly adapted for wearable articles considering, amongst other factors the hardware, battery and size constraints of existing wearable articles."*
>
> *The present disclosure therefore enables for the federated learning of a machine-learned model from data sensed by a plurality of wearable articles 20 potentially spread over a wide geographic location."*

39 US 2015/0242760 A1 (MIAO et al.) which was previously cited in the examination process describes "consensus learning", which appears to have the same technical features as federated learning. Here client devices, which may be wearable computers, use a machine learning model received from a server to determine a user state (whether the user is happy or sad, for example) from image data. Client devices are configured to modify the received machine learning model to generate an updated machine learning model. This modification can be based upon images (sensor data) captured of the user, for example. The updated machine learning

model is transmitted to the server. The server also receives updated machine learning models from other client devices and modifies a global machine learning model based upon all the client devices. This updated global machine learning model is then returned to the client devices for further updating or refining. Please see Figs 4 & 5 and paragraphs 54 to 67 of this document for full details.

40 It is also a feature of the federated learning or consensus learning of MIAO that personal data of the user does not have to leave the client device or electronics arrangement in the language of the present invention.

41 In their letter of 12 October 2022, the applicant submits that:

> *"The contribution relates to an improved arrangement for generating physiological classifications using physiological sensor data. A first model update is performed locally on the electronics arrangement rather than remotely on an external computer apparatus. The updated model data is sent to the external computer apparatus for use in determining a second model update. The second model update may consider updated model data received from a number of different wearable articles.*
>
> *There are a number of advantages to the claimed arrangement. The model update performed locally enables the local model to be updated and improved rapidly. The model update performed remotely can consider model updates from a number of different wearable articles to provide a comprehensive model update. In addition, the claimed arrangement provides security and power consumption advantages as explained previously."*

42 Again, these submissions relate to the previously known advantages of federated or "consensus" learning. The power consumption benefits arise because sensor data is not streamed to the external computing apparatus or server, which is a feature of conventional federated learning.

43 The most recent letter from the applicant submits that the invention provides:

> *"an improved classification of physiological data i.e. an improved assessment of the physiological state of a wearer, as the machine-learned model is updated over time as more and more physiological data is acquired and this is done by making sure that the model is updated using relevant data i.e if it is determined that the machine-learned model should use the data as training data."*

And

> *"..the invention is about providing an improved measure of physiological state by improving the way in which the electronics arrangement, and the system as whole, operates, by selecting relevant data as training data and being able to update the machine-learning model in a more optimally computational way and which can be used no matter how many wearable articles are in communication with the external computer apparatus."*

44 These submissions concentrate on the nature of the machine learning model updating at the electronics arrangement and the continual nature of the updating. With respect to these characteristics of the claimed invention, I note that US 2019/0340567 A1 (LONG et al.), published 7 November 2019 and previously cited in the examination process, has both iterative and confidence-based modification of the

machine-learning algorithm – see paragraphs 21-23 of this document. There appears to be no contribution in this characteristic of the claimed invention, of itself.

45 In their pre-hearing report, the examiner has provided the following as their assessment of the actual contribution:

> *"a computer implemented method for preventing user physiological data being sent to a server by obtaining a machine-learned model for performing physiological classification and physiological data from a sensor of a wearable device, using the model to generate a physiological classification using the data which is compared to a predetermined threshold, and if greater than the threshold updating the model using the data, transmitting updated model data to an external computer, and receiving an updated model, based on the updated model data, from the external computer."*

46 This appears to be a reasonably accurate summary of the claimed invention but does not seem to take account of the advantages of the invention or problems addressed. It also does not account for the construction of claims 1 and 18 I have found with respect to the updated machine learning model received from the external computer.

47 That being said, the problems addressed by the claimed invention – namely data privacy and improving a machine learning model both locally and collaboratively – are addressed by the use of conventional machine learning techniques, as demonstrated by the prior art noted above and no additional advantages or benefits appear to be provided by the present invention.

48 In light of this, it is my opinion that the contribution of the present invention, as I have construed it is:

a computer implemented method using an electronics arrangement and an external computer, the method comprising: at an electronics arrangement of obtaining both a machine-learned model for performing physiological classification and physiological data from a sensor of a wearable device; using the model to generate a physiological classification using the data; the confidence of the classification being compared to a predetermined threshold, and if the confidence is greater than the threshold, updating the model using the data; transmitting updated model data to an external computer, and receiving an updated model, based on the updated model data from a number of electronics arrangements, from the external computer; the method using conventional machine learning technology to improve the machine learning model both locally and remotely and having the benefits of this conventional machine learning technology.

(3) Ask whether it falls solely within the excluded subject matter, and (4) Check whether the actual or alleged contribution is actually technical in nature

49 In their submissions the applicant has referred to both the *HTC/AT&T* signposts and also the scenarios provided with the IPO's guidance on examining patent applications relating to artificial intelligence (AI) inventions. I will deal with the *HTC/AT&T* signposts first.

50 In the course of examination, the applicant has submitted that signposts 1, 3, 4 and 5 are all satisfied. I will consider each of these signposts in turn.

51 Signpost 1 is said to be satisfied as the invention concerns the technical task of classifying real-world physiological sensor data to determine the user's state, such as the user's cardiac state, respiratory state, stress levels, emotional state or fatigue. I would also add classifying whether or not the user is drowsy to this, given that it is also mentioned with the other states. I am not certain that determining whether or not a user is fatigued or ascertaining their emotional state (such as whether they are happy or sad) is a technical task even though it may use real-world sensor data. I note that there is no improvement to the underlying measurement of the user's physiological data and that the invention and its contribution relates to the interpretation of conventionally obtained sensor data. I am not convinced that signpost 1 is satisfied.

52 With respect to signpost 3, the applicant submits that the interaction between the electronics arrangement and the external computer is new, and the processes on each of the electronics arrangement and the external computer is new, and therefore signpost 3 is satisfied. I am not convinced that this is correct. Whilst the computers used in the invention may be programmed to perform new or different tasks, this does not mean that the computers are operating in a new way. Instead, the computers are operating conventionally to execute new programs. This does not satisfy signpost 3.

53 In regard to signpost 4, the applicant has stated that this signpost is satisfied because the electronics arrangement is a better device. This is because the invention means that the electronics arrangement does not have to stream sensor data to the external computer, and so reduces the power consumption of the device and improves data security. As previously noted, the elements of the invention and the functionality that provides the benefits of reduced power consumption and data security/privacy are found in conventional federated learning systems of which the present invention is a specific example. The present invention makes no additional contribution to these benefits and so the applicant's submissions are not persuasive. It is also noted that the benefits only relate to the specific task of classifying a user's state based on physiological data. The signpost requires that the computer is a better computer in the sense of running more efficiently and effectively *as a computer* (emphasis added). There is no benefit to the efficiency or effectiveness as a computer to any computer required by the claimed invention irrespective of the task performed. This further suggests that signpost 4 is not satisfied.

54 This conclusion with respect to signpost 4 appears to be consistent with *Autonomy* [5] (previously mentioned by the examiner) in which it was said:

> *"The mere fact that a computer program reduces the load on the processor or makes economical use of the computer's memory or makes more efficient use of the computer's resources does not amount to making a better computer, and thus does not take it outside the category of computer program as such" (paragraph 29 viii).*

[5] *Autonomy Corp Ltd v Comptroller General of Patents, Trade Marks & Designs* [2008] EWHC 146 (Pat)

55 Finally, the applicant submits that signpost 5 is satisfied because the invention solves data security and power consumption issues as outlined with respect to signpost 4. Whilst the present invention uses known machine learning techniques that address these issues, namely federated learning, the present invention makes no additional contribution to these issues. Therefore, I am not convinced that signpost 5 is satisfied since the present invention makes no additional contribution to further address these issues.

56 I am therefore satisfied that none of the *HTC/AT&T* signposts point towards a technical contribution.

57 In relation to the IPO's guidance on examining patent applications relating to artificial intelligence (AI) inventions, and the scenarios in particular, I note that the document itself states that it is not a source of law and the "opinions on the patentability of the scenarios shall not binding for any purpose under the Patents Act 1977."

58 However, for the avoidance of doubt, I think that there are subtle differences between scenarios 3 and 6, given by the applicant as supporting their position that the present invention involves a technical contribution.

59 Whilst scenario 3 relates to the analysis of sensor data, potentially collected via a sports watch (a wearable article) in order to classify the motion of a user, and so seems similar to the present invention, I note that the data used in the scenario is from three different types of sensor that is together used to determine a motion vector. This determination of the motion vector is said to form part of the contribution. There is no equivalent functionality in the present invention. The scenario also suggests that the task of classifying the motion vector as a particular movement is a technical process concerning the classification of real-world sensor data as a determined movement. Whist the present invention uses real-world sensor data, this data does not need to relate to movement and so a type of movement is not necessarily classified in the present invention. Instead, sound data could be used to determine if the user is fatigued or drowsy in the present invention.

60 Scenario 6 relates to the interpretation of image data of a ventricle of a heart via a neural network to output a percentage of blood ejection for the heart. This relates a providing a specific measurement of a physical system. The present invention is not used to provide such a specific measurement and so the scenario is not applicable to the present invention.

61 Having considered both the signposts and the scenarios, I am not convinced that the present invention provides the required technical contribution.

62 Stepping back and considering the invention as a whole, although the present invention concerns the assessment of sensor data collected via a wearable article to provide a physiological classification, and the improvement of the machine-learned models both locally at an electronics arrangement and remotely at an external computer which updates the model based on a plurality of local updates, the present invention relates to computer programs that do not provide a technical contribution as the machine-learning methods used to implement the invention are conventional in the art and the invention does not add anything to the known benefits of these known machine learning methods.

63 It follows that the invention defined in claims 1 and 18 is excluded from patentability as a program for a computer, as such.

Conclusion

64 The application does not comply with section 1(2) as it relates to a program for a computer, as such. I therefore refuse the application under section 18(3).

Appeal

65 Any appeal must be lodged within 28 days after the date of this decision.

J PULLEN

Deputy Director, acting for the Comptroller