

PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To: KRISHNAN, Ashok P O Box 6808 Charnwood Australian Capital Territory 2615 Australia	<h2 style="margin: 0;">PCT</h2> <p style="margin: 0;">WRITTEN OPINION OF THE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY (PCT Rule 66)</p>
	Date of mailing <i>(day/month/year)</i> 17 May 2019
Applicant's or agent's file reference AVAU15Nov18	REPLY DUE within TWO MONTHS from the above date of mailing
International application No. PCT/AU2018/051223	International filing date <i>(day/month/year)</i> 15 November 2018
	Priority date <i>(day/month/year)</i> 20 November 2017
International Patent Classification (IPC) or both national classification and IPC See Supplemental Box	
Applicant KRISHNAN, Ashok	

1. The written opinion established by the International Searching Authority:
 is is not
 considered to be a written opinion of the International Preliminary Examining Authority.

2. This **Third** opinion contains indications relating to the following items:
 - Box No. I Basis of the opinion
 - Box No. II Priority
 - Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - Box No. IV Lack of unity of invention
 - Box No. V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
 - Box No. VI Certain documents cited
 - Box No. VII Certain defects in the international application
 - Box No. VIII Certain observations on the international application

3. The applicant is hereby **invited to reply** to this opinion.

When? See the **Reply Due** date indicated above. However, the Australian Patent Office will not establish the Report before the earlier of (i) a response being filed, or (ii) one month before the **Final Date** by which the international preliminary examination report must be established. The Report will take into account any response (including amendments) filed before the Report is established. **If no response is filed by 1 month before the Final Date**, the international preliminary examination report will be established on the basis of this opinion.

Applicants wishing to have the benefit of a further opinion (if needed) before the report is established should ensure that a response is filed at least **3 months before the Final Date** by which the international preliminary examination report must be established.

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 55.3 and 66.8.

Also For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4*bis*. For an informal communication with the examiner, see Rule 66.6. For an additional opportunity to submit amendments, see Rule 66.4.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The **FINAL DATE** by which the international preliminary report on patentability (Chapter II of the PCT) must be established according to Rule 69.2 is: **20 March 2020**

Name and mailing address of the IPEA AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaaustralia.gov.au	Authorised Officer Ronaldo Sanchez AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. +61262832653
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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - The international application in the language in which it was filed:
 - A translation of the international application into , which is the language of a translation furnished for the purposes of :
 - international search (under Rules 12.3(a) and 23.1 (b)).
 - publication of the international application (under Rule 12.4(a)).
 - international preliminary examination (Rules 55.2(a) and/or 55.3(a) and (b)).
2. With regard to the **elements** of the international application, this opinion has been established on the basis of (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed."):
 - the international application as originally filed/furnished
 - the description: pages 1-93 , as originally filed/furnished
 - pages , received by this Authority on with the letter of
 - pages , received by this Authority on with the letter of
 - the claims: Nos. , as originally filed/furnished
 - Nos. , as amended (together with any statement) under Article 19,
 - Nos. 1-30 , received by this Authority on 10 April 2019 with the letter of 10 April 2019
 - Nos. , received by this Authority on with the letter of
 - the drawings: pages 1/31-31/31 , as originally filed/furnished
 - pages , received by this Authority on with the letter of
 - pages , received by this Authority on with the letter of
 - a sequence listing - see Supplemental Box Relating to Sequence Listing.
3. The amendments have resulted in the cancellation of:
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (specify):
4. This opinion has been established as if (some of) the amendments listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)).
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (specify):
5. This opinion has been established:
 - taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 66.1(d-bis)).
 - without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 66.4bis).
6. Supplementary international search report(s) from Authority(ies) has/have been received and taken into account in establishing this opinion (Rule 45 bis.8(b) and (c)).

Box No. IV **Lack of unity of invention**

1. In response to the invitation (Form PCT/IPEA/405) to restrict or pay additional fees the applicant has, within the applicable time limit:
- restricted the claims
 - paid additional fees
 - paid additional fees under protest and, where applicable, the protest fee
 - paid additional fees under protest but the applicable protest fee was not paid
 - neither restricted the claims nor paid additional fees
2. This Authority found that the requirement of unity of invention is not complied with for the following reasons and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

See Supplemental Box

3. Consequently, this opinion has been established in respect of the following parts of the international application:
- all parts.
 - the parts relating to claims Nos.

Box No. V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-30	YES
	Claims NONE	NO
Inventive step (IS)	Claims 1-30	YES
	Claims NONE	NO
Industrial applicability (IA)	Claims 1-30	YES
	Claims NONE	NO

2. CITATIONS AND EXPLANATIONS:

CITATIONS

D1: US 2016/0001781 A1 (HONDA MOTOR CO., LTD.) 07 January 2016
 D2: US 2014/0148988 A1 (VOLKSWAGEN AG) 29 May 2014
 D3: US 5835008 A (COLEMERE, JR.) 10 November 1998
 D4: WO 2016/169582 A1 (BAYERISCHE MOTOREN WERKE AKTIENGESELLSCHAFT et al.) 27 October 2016
 D5: US 2016/0303972 A1 (AUDI AG) 20 October 2016
 D6: US 2015/0175168 A1 (LYTX, INC.) 25 June 2015
 D7: WO 2016/077779 A1 (SMARTDRIVE SYSTEMS, INC.) 19 May 2016
 D8: US 2016/0173864 A1 (BEIJING ZHIGU RUI TUO TECH CO., LTD.) 16 June 2016
 D9: US 2016/0249803 A1 (CANON KABUSHIKI KAISHA) 01 September 2016

NOVELTY (N)

Invention 1 (claims 1-11 and 28-29)

Regarding claims 1 and 28, the closest prior art D1 discloses a system comprising: at least one imaging device configured to acquire images of at least one eye of a human subject operating a vehicle (Paragraphs [0277], [0278], [0282]; Fig. 1A item 162 "optical sensing device"), a processing unit configured to process the acquired images to extract eye data from said images, the eye data corresponding to movement of the at least one eye and associated with at least one of: saccades, glissades, square-wave jerks, smooth pursuits (Fig. 3 item 332 "eye/facial movement monitoring system" and item 316 "pupil dilation monitoring system", Paragraphs [0378]-[0379], [0423]). However, D1 does not disclose that the eye data is used to form training data and wherein the training data is used to train vehicles to become partially or fully autonomous or to improve their autonomous functioning. Therefore, the invention defined in these claims is novel.

Appended claims 2-7 add further features to those defined in claim 1 and are therefore also novel.

Regarding claims 8 and 29, the closest prior art D1 discloses a vehicle driven by a human (Fig. 1A), the vehicle having a brake pedal and an accelerator pedal controlled by a foot of the human, and a wall behind these pedals (Fig. 76-77); and data relating to eye movement of the human (Fig. 3 item 332 "eye/facial movement monitoring system" and item 316 "pupil dilation monitoring system", Paragraphs [0378]-[0379], [0423]). However, D1 does not disclose recording a signature of an event outside a vehicle; distance of the accelerator and brake pedals from the wall behind the pedals as well as from the foot of the human; and wherein the signature is used to train vehicles to become partially or fully autonomous or to improve their autonomous functioning. Therefore, the invention defined in these claims is novel.

Appended claims 9-11 add further features to those defined in claim 8 and are therefore also novel.

Therefore, the subject matter of claims 1-11 and 28-29 is new and meets the requirements of Article 33(2) of the PCT with regards to novelty.

Invention 2 (claims 12-19)

D4 does not disclose the features of one secondary human event related to a hand or foot event, and making a determination that an outside event has occurred if at least one each of a primary human event as well as a secondary human event has occurred, and neither of the primary or secondary human events correlates with an associated map as defined in claim 12; and the features of making a determination that an outside event has occurred if at least one primary human event as well as at least one primary vehicle event has occurred, and neither the at least one of primary human events nor the at least one of primary vehicle events correlates with an associated map as defined in claim 13. Therefore, the invention defined in these claims is novel.

Appended claims 14-19 add further features to those defined in claims 12-13 and are therefore also novel.

Therefore, subject matter of claims 12-19 does meet the requirement of Article 33(2) of the PCT with regards to novelty.

Invention 3 (claims 20-27 and 30)

The features that the subject's combined score by combing the total raw event score, the total raw non-event score, the total scaled event score and the total scaled non-event score as defined in claims 20 and 30 are not disclosed in any of the prior art documents D6 and D7. Therefore, the invention defined in these claims is novel.

Appended claims 21-27 add further features to those defined in claim 20 and are therefore also novel.

Therefore, subject matter of claims 20-27 and 30 does meet the requirement of Article 33(2) of the PCT with regards to novelty.

INVENTIVE STEP (IS)

Invention 1 (claims 1-11 and 28-29)

The claimed invention as defined in claims 1 and 28 is characterised by the features that the eye data is used to form training data and wherein the training data is used to train vehicles to become partially or fully autonomous or to improve their autonomous functioning. These features are not obvious to a person skilled in the art from the cited documents, when taken individually or in any combination. Therefore, the invention defined in these claims involve an inventive step.

Appended claims 2-7 add further features to those defined in claim 1 and are therefore also involve an inventive step.

The claimed invention as defined in claims 8 and 29 is characterised by the features of recording a signature of an event outside a vehicle; distance of the accelerator and brake pedals from the wall behind the pedals as well as from the foot of the human; and wherein the signature is used to train vehicles to become partially or fully autonomous or to improve their autonomous functioning. These features are not obvious to a person skilled in the art from the cited documents, when taken individually or in any combination. Therefore, the invention defined in these claims involve an inventive step.

Appended claims 9-11 add further features to those defined in claim 8 and are therefore also involve an inventive step.

Therefore, the subject matter of claims 1-11 and 28-29 is not obvious and meets the requirements of Article 33(3) of the PCT with regards to inventive step.

Invention 2 (claims 12-19)

The claimed invention as defined in claim 12 is characterised by the features of one secondary human event related to a hand or foot event, and making a determination that an outside event has occurred if at least one each of a primary human event as well as a secondary human event has occurred, and neither of the primary or secondary human events correlates with an associated map. These features are not obvious to a person skilled in the art from the cited documents, when taken individually or in any combination. Therefore, the invention defined in this claim involve an inventive step.

The claimed invention as defined in claim 13 is characterised by the features of making a determination that an outside event has occurred if at least one primary human event as well as at least one primary vehicle event has occurred, and neither the at least one of primary human events nor the at least one of primary vehicle events correlates with an associated map. These features are not obvious to a person skilled in the art from the cited documents, when taken individually or in any combination. Therefore, the invention defined in this claim involve an inventive step.

Appended claims 14-19 add further features to those defined in claims 12-23 and are therefore also involve an inventive step.

Therefore, the subject matter of claims 12-19 is not obvious and meets the requirements of Article 33(3) of the PCT with regards to inventive step.

Invention 3 (claims 20-27 and 30)

The claimed invention as defined in claims 20 and 30 is characterised by the features of subject's combined score by combining the total raw event score, the total raw non-event score, the total scaled event score and the total scaled non-event score. These features are not obvious to a person skilled in the art from the cited documents, when taken individually or in any combination. Therefore, the invention defined in these claims involve an inventive step.

Appended claims 21-27 add further features to those defined in claim 20 and are therefore also involve an inventive step.

Therefore, the subject matter of claims 20-27 and 30 is not obvious and meets the requirements of Article 33(3) of the PCT with regards to inventive step.

INDUSTRIAL APPLICABILITY (IA)

The invention defined in claims 1-30 is considered to meet the requirements of Industrial Applicability under Article 33(4) of the PCT because it can be made by, or used in, industry.

WRITTEN OPINION OF THE
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

International Application No.

Supplemental Box – IPC Marks

PCT/AU2018/051223

G06N 3/02 (2006.01)

G05D 1/00 (2006.01)

A61B 3/113 (2006.01)

B62D 1/04 (2006.01)

G05G 1/38 (2008.04)

G01S 5/22 (2006.01)

B60W 40/00 (2006.01)

A61B 3/14 (2006.01)

Continuation of: **Box IV**

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Invention 1: Claims 1 to 11 and 28 to 29 are directed to a system and method training vehicles. The feature of the means to acquiring eye movement data used in training vehicles for autonomous functioning is specific to this group of claims.
- Invention 2: Claims 12 to 19 are directed to a method of determining if an event outside a vehicle operated by a human subject occurred. The feature of the means to making a determination that an outside event has occurred based on a primary human event is specific to this group of claims.
- Invention 3: Claims 20 to 27 and 30 are directed to a method to train vehicles scoring a subject operating a vehicle in a segment of a path. The feature of means to scoring the subjects performance is specific to this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. Therefore, there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied *a priori*.