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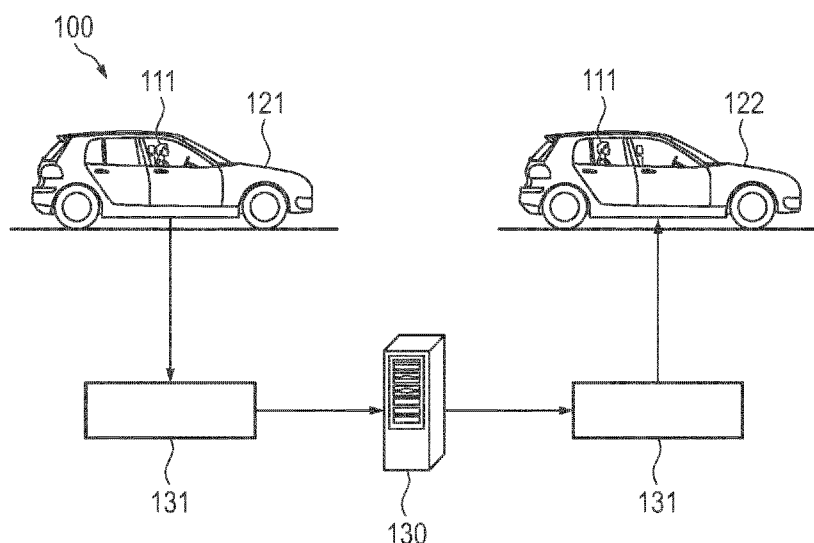


Fig. 1

(57) Abstract: According to a demonstrative embodiment of the present invention, a method, device, medium, and vehicle for providing individual driving experience is provided. The method comprises obtaining first driving behaviour data of a first user collected from at least one vehicle, wherein the first driving behaviour data includes the operational data of the first user collected from his/her operation on at least one mentioned vehicle. The method further comprises controlling the current vehicle to provide corresponding individual driving experience to the first user based on the first driving behaviour data of the first user. According to an embodiment of the present invention, driving behaviour data of each user in respective vehicle are collected, and then assisted driving or automatic driving of the current vehicle is controlled on the basis of respective driving behaviour data, so that a user is given a feeling that he/she is driving himself/herself, and thus the user's individual driving experience is improved.

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Description

5 Method, device, medium, and vehicle for providing individual driving experience

Technical Field

10 [001] Embodiments of the present disclosure, in general, relate to the field of intelligent driving, in particular to a method, device, medium, and vehicle for providing individual driving experience.

Technical Background

15 [002] With the rapid development of electronic technology and network technology, vehicles are becoming more and more intelligent. Vehicle intelligence is closely related to vehicle electronic technology, and intelligent vehicles have been able to realise certain functions such as real scene navigation, voice control, and distance detection. With the continuous development in technologies of internet of vehicles, intelligent vehicles will be able to implement direct communication processes such as car-to-road and car-to-car
20 communications. Therefore, vehicle intelligence is considered to be an innovative change and development of existing vehicle electronic technology.

25 [003] Automatic driving vehicles, also known as unmanned vehicles, are intelligent vehicles that are driven by computer systems. The automatic driving vehicle learns real-time traffic conditions around the vehicle through video cameras, radar sensors, and laser distance detectors, and achieves precise navigation and control of the vehicle
30 through high-precision maps and accurate calculations. According to the level of automation, automatic driving can be divided into the following stages: assistance driving, partial automation driving, high automation driving and full automation driving. In the assisted driving stage, some assistance driving functions are provided, such as auxiliary braking.

35 [004] The design of today's vehicle assistance driving functions (e.g. active safety system) decides whether to trigger a warning or to trigger an active intervention based on the same hazard limits. Different driving individuals, however, may have very different definitions of hazard and hazard tolerances. Based on the current development routes of the technologies, products in the market cannot meet the individual needs of users. On the contrary, users tend to stop using the products or functions because they are not smart enough to deliver their desired performance.

Summary of the Invention

[005] According to a demonstrative embodiment of the present disclosure, a method, apparatus, device, computer-readable medium, and vehicle for providing individual driving experience are provided, capable of providing corresponding driving behaviour data to each user.

[006] In a first aspect of the present disclosure, a method for providing individual driving experience is provided. The method comprises: obtaining the first driving behaviour data of the first user collected from at least one vehicle, wherein the first driving behaviour data includes the operational data of the first user collected from his/her operation on at least one mentioned vehicle; and controlling the current vehicle to provide individual driving experience to the first user based on the first driving behaviour data of the first user. In this manner, driving behaviour data of each user in respective vehicle are collected, and then assisted driving or automatic driving of the current vehicle is controlled on the basis of respective driving behaviour data, so that a user is given a feeling that he/she is driving himself/herself, and thus the user's individual driving experience is improved.

[007] In certain embodiments, the controlling of the current vehicle to provide individual driving experience to the first user comprises: identifying the first driving habit of the first user based on the first driving behaviour data of the first user; and controlling the current vehicle to provide individual driving experience in correspondence to the first driving habit to the first user. An analysis of driving behaviour data of each user allows the driving habits of each user to be determined, helping to provide more accurate individual driving experience.

[008] In certain embodiments, the current vehicle is different from at least one mentioned vehicle and the current vehicle is of a higher automatic driving level than at least one mentioned vehicle, or the current vehicle and at least one mentioned vehicle have the same automatic driving level and the current vehicle has more driving assistance systems than at least one mentioned vehicle, the method further comprising: collecting the operational data of the first user from his/her operation on the current vehicle. In this manner, driving behaviour data of a user from his/her operations on automatic driving vehicles having different levels or different functions may be collected; with increases in the automatic driving levels or functions of driven vehicles, data of automatic driving vehicles having higher levels or functions in more complicated work conditions continue to be collected, and driving behaviour data and driving habit data of users are improved continuously; thus, driving behaviour databases are enriched to further improve the individual driving experience of users.

[009] In certain embodiments, the method further comprises: identifying the second driving habit of the second user based on the second driving behaviour data of the

second user collected from his/her operation on a vehicle, wherein the second driving habit is different from the first driving habit in at least one of the following aspects: driving speed, following distance, acceleration control, and brake control; and controlling the current vehicle to provide individual driving experience in correspondence to the second driving habit to the second user. Thus, even if different users ride the same vehicle, they may respectively gain different driving experiences provided on the basis of respective historical driving habits, and therefore take greater delight in driving.

[010] In certain embodiments, the obtaining of the first driving behaviour data of the first user collected from at least one mentioned vehicle comprises: in response to the first user's entering the current vehicle, verifying the first identity of the first user by biometric identification or account login; in response to the mentioned first identity being verified, identifying the first identifier of the first user; and obtaining the first driving behaviour data from a driving behaviour server based on the first identifier of the first user, wherein the driving behaviour server stores the driving behaviour data of a plurality of users collected through on-board driving assistance systems and the on-board driving assistance systems include an image capturing device, a radar device, and a GPS system. Verification of user identity by biometric identification (such as fingerprint identification and facial recognition) allows an increase in user verification efficiency, thereby decreasing unnecessary login burden placed on a user. In addition, storage of driving behaviour data of a large number of users allows the establishment of an extremely valuable driving behaviour database and ecosystem; moreover, possession of a personal driving behaviour data account may motivate each user to upload data.

[011] In certain embodiments, the obtaining of the first driving behaviour data of the first user collected from at least one mentioned vehicle comprises: obtaining the first scene data collected from the first user's operation on at least one mentioned vehicle in the first scene; and obtaining the second scene data collected from the first user's operation on at least one mentioned vehicle in the second scene, wherein the first scene is differentiated from the second scene in at least one of the following aspects: weather conditions, road type, time intervals, and area type. In this manner, driving behaviour data that are more fine-grained may be obtained, which facilitates subsequent driving behaviour analysis and automatic driving control, thereby further improving a user's driving experience in the current vehicle.

[012] In certain embodiments, the controlling of the current vehicle to provide individual driving experience in correspondence to the first driving habit to the first user comprises: in response to the first user's riding the current vehicle in the first scene, controlling the current vehicle to maintain at least the first distance with the vehicle ahead; and in response to the first user's riding the current vehicle in the second scene, controlling the current vehicle to maintain at least the second distance with the vehicle ahead, wherein the first scene is in a sunny day and the second scene is in a rainy day and the first

distance is shorter than the second distance. In this manner, automatic driving functions become more humanised, and users' driving experience is further improved.

[013] In certain embodiments, the controlling of the current vehicle to provide individual driving experience in correspondence to the first driving habit to the first user comprises:

5 identifying the average speed at which the first user drives at least one mentioned vehicle on a highway; and in response to the current vehicle's driving on the highway, controlling the automatic driving of the current vehicle on the highway based on the average speed. In this manner, the automatic driving of a vehicle is made more suitable to the driving style and habit of a user, thereby improving user satisfaction.

10 [014] In certain embodiments, the controlling of the current vehicle to provide individual driving experience in correspondence to the first driving habit to the first user comprises: in response to the driving feedback from the first user, adjusting the driving control to the current vehicle; collecting the driving environment data of the current vehicle within a predetermined period before the driving feedback made; and modifying the automatic
15 driving algorithm based on the collected driving environment data. In this manner, user feedback may be handled and predetermined mode parameters modified, so that the automatic driving or assisted driving function becomes more intelligent and accurate.

[015] In certain embodiments, the controlling of the current vehicle to provide individual driving experience in correspondence to the first driving habit to the first user comprises:

20 in response to the current vehicle as an assisted driving vehicle or a partially automated driving vehicle, controlling at least one of the following functions of the current vehicle according to the first driving habit: adaptive cruise, lane keeping assist, and automatic emergency braking. In this manner, in an assisted driving scene, the user's driving experience may also be improved, and thus the applicable scope of embodiments of the
25 present disclosure is expanded.

[016] In certain embodiments, the controlling of the current vehicle to provide individual driving experience in correspondence to the first driving habit to the first user comprises: in response to the current vehicle as a fully automatic driving vehicle, controlling the fully automatic driving process of the current vehicle according to the first driving habit. In this
30 manner, a user may, during a fully automatic driving process, experience the same feeling and pleasure as is experienced when he/she drives himself/herself, and thus the user experience is improved.

[017] In a second aspect of the present disclosure, a device for providing individual driving experience is provided. The device comprises: at least one processing unit and at
35 least one memory, wherein at least one memory is coupled to at least one mentioned processing unit and stores instructions for execution by at least one mentioned processing unit; wherein the execution of instructions by at least one mentioned processing unit causes the device to perform actions. The actions comprise: obtaining the first driving behaviour data of the first user collected from at least one vehicle,

wherein the first driving behaviour data includes the operational data of the first user collected from his/her operation on at least one mentioned vehicle; and controlling the current vehicle to provide individual driving experience to the first user based on the first driving behaviour data of the first user. In this manner, driving behaviour data of each user in respective vehicles are collected, and then assisted driving or automatic driving of the current vehicle is controlled on the basis of respective driving behaviour data, so that a user is given a feeling that he/she is driving himself/herself, and thus the user's individual driving experience is improved.

[018] In certain embodiments, the controlling of the current vehicle to provide individual driving experience to the first user comprises: identifying the first driving habit of the first user based on the first driving behaviour data of the first user; and controlling the current vehicle to provide individual driving experience in correspondence to the first driving habit to the first user. An analysis of driving behaviour data of each user allows the driving habits of each user to be determined, helping to provide more accurate individual driving experience.

[019] In certain embodiments, the current vehicle is different from at least one mentioned vehicle and the current vehicle is of a higher automatic driving level than at least one mentioned vehicle, or the current vehicle and at least one mentioned vehicle have the same automatic driving level and the current vehicle has more driving assistance systems than at least one mentioned vehicle, the actions further comprising: collecting the operational data of the first user from his/her operation on the current vehicle. In this manner, driving behaviour data of a user from his/her operations on automatic driving vehicles having different levels or different functions may be collected; with increases in the automatic driving levels or functions of driven vehicles, data of automatic driving vehicles having higher levels or functions in more complicated work conditions continue to be collected, and driving behaviour data and driving habit data of users are improved continuously; thus, driving behaviour databases are enriched to further improve the individual driving experience of users.

[020] In certain embodiments, the actions further comprise: identifying the second driving habit of the second user based on the second driving behaviour data of the second user collected from his/her operation on a vehicle, wherein the second driving habit is different from the first driving habit in at least one of the following aspects: driving speed, following distance, acceleration control, and brake control; and controlling the current vehicle to provide individual driving experience in correspondence to the second driving habit to the second user. Thus, even if different users ride the same vehicle, they may respectively gain different driving experiences provided on the basis of respective historical driving habits, and therefore take greater delight in driving.

[021] In certain embodiments, the obtaining of the first driving behaviour data of the first user collected from at least one mentioned vehicle comprises: in response to the first

user's entering the current vehicle, verifying the first identity of the first user by biometric identification or account login; in response to the mentioned first identity being verified, identifying the first identifier of the first user; and obtaining the first driving behaviour data from a driving behaviour server based on the first identifier of the first user, wherein the driving behaviour server stores the driving behaviour data of a plurality of users collected through on-board driving assistance systems and the on-board driving assistance systems include an image capturing device, a radar device, and a GPS system. Verification of user identity by biometric identification (such as fingerprint identification and facial recognition) allows an increase in user verification efficiency, thereby decreasing unnecessary login burden placed on a user. In addition, storage of driving behaviour data of a large number of users allows the establishment of an extremely valuable driving behaviour database and ecosystem; moreover, possession of a personal driving behaviour data account may motivate each user to upload data.

[022] In certain embodiments, the obtaining of the first driving behaviour data of the first user collected from at least one mentioned vehicle comprises: obtaining the first scene data collected from the first user's operation on at least one mentioned vehicle in the first scene; and obtaining the second scene data collected from the first user's operation on at least one mentioned vehicle in the second scene, wherein the first scene is differentiated from the second scene in at least one of the following aspects: weather conditions, road type, time intervals, and area type. In this manner, driving behaviour data that are more fine-grained may be obtained, which facilitates subsequent driving behaviour analysis and automatic driving control, thereby further improving a user's driving experience in the current vehicle.

[023] In certain embodiments, the controlling of the current vehicle to provide individual driving experience in correspondence to the first driving habit to the first user comprises: in response to the first user's riding the current vehicle in the first scene, controlling the current vehicle to maintain at least the first distance with the vehicle ahead; and in response to the first user's riding the current vehicle in the second scene, controlling the current vehicle to maintain at least the second distance with the vehicle ahead, wherein the first scene is in a sunny day and the second scene is in a rainy day and the first distance is shorter than the second distance. In this manner, automatic driving functions become more humanised, and users' driving experience is further improved.

[024] In certain embodiments, the controlling of the current vehicle to provide individual driving experience in correspondence to the first driving habit to the first user comprises: identifying the average speed at which the first user drives at least one mentioned vehicle on a highway; and in response to the current vehicle's driving on the highway, controlling the automatic driving of the current vehicle on the highway based on the average speed. In this manner, the automatic driving of a vehicle is made more suitable to the driving style and habit of a user, thereby improving user satisfaction.

[025] In certain embodiments, the controlling of the current vehicle to provide individual driving experience in correspondence to the first driving habit to the first user comprises: in response to the driving feedback from the first user, adjusting the driving control to the current vehicle; collecting the driving environment data of the current vehicle within a predetermined period before the driving feedback made; and modifying the automatic driving algorithm based on the collected driving environment data. In this manner, user feedback may be handled and predetermined mode parameters modified, so that the automatic driving or assisted driving function becomes more intelligent and accurate.

[026] In certain embodiments, the controlling of the current vehicle to provide individual driving experience in correspondence to the first driving habit to the first user comprises: in response to the current vehicle as an assisted driving vehicle or a partially automated driving vehicle, controlling at least one of the following functions of the current vehicle according to the first driving habit: adaptive cruise, lane keeping assist, and automatic emergency braking. In this manner, in an assisted driving scene, the user's driving experience may also be improved, and thus the applicable scope of embodiments of the present disclosure is expanded.

[027] In certain embodiments, the controlling of the current vehicle to provide individual driving experience in correspondence to the first driving habit to the first user comprises: in response to the current vehicle as a fully automatic driving vehicle, controlling the fully automatic driving process of the current vehicle according to the first driving habit. In this manner, a user may, during a fully automatic driving process, experience the same feeling and pleasure as is experienced when he/she drives himself/herself, and thus the user experience is improved.

[028] In a third aspect of the present disclosure, a computer-readable storage medium is provided, on which a computer program is stored, wherein the execution of the program implements the method as described in the first aspect above. It should be understood that a computer-readable storage medium as described in the third aspect may be deployed in a vehicle or in a server, which allows greater flexibility in embodiments of the present disclosure.

[029] In a fourth aspect of the present disclosure, a vehicle is provided, comprising a device for providing individual driving experience according to the second aspect above. In this manner, a method and device according to an embodiment of the present disclosure may be deployed in the current vehicle to improve a user's experience in driving or riding the current vehicle.

[030] It should be understood that the contents described in this section are not intended to limit any key characteristics or important characteristics of an embodiment of the present disclosure or restrict the scope of the present disclosure. Other characteristics of the present disclosure will be made easy to understand by the following description.

Brief Description of the Drawings

[031] In conjunction with the drawings and with reference to the following detailed description, the above-described and other characteristics, advantages, and aspects of embodiments of the present disclosure will become more obvious. In the drawings, the same or similar reference numerals denote the same or similar elements, wherein

[032] Fig. 1 shows an exemplary environment in which individual driving experience is provided according to an embodiment of the present disclosure;

[033] Fig. 2 is a flowchart for a method for providing individual driving experience according to an embodiment of the present disclosure;

[034] Fig. 3 shows another exemplary environment in which individual driving experience is provided according to an embodiment of the present disclosure;

[035] Fig. 4 shows yet another exemplary environment in which individual driving experience is provided according to an embodiment of the present disclosure;

[036] Fig. 5 is a block diagram for an exemplary architecture of an on-board driving assistance system according to an embodiment of the present disclosure;

[037] Fig. 6A shows a schematic diagram for a scene on a sunny day in which individual driving experience is provided according to an embodiment of the present disclosure;

[038] Fig. 6B shows a schematic diagram for a scene on a rainy day in which individual driving experience is provided according to an embodiment of the present disclosure;

[039] Fig. 7 is a flowchart for a method for handling driving feedback from a user according to an embodiment of the present disclosure; and

[040] Fig. 8 is a block diagram for a device that is able to implement a plurality of embodiments of the present disclosure.

Specific Embodiments

[041] Embodiments of the present disclosure will be described below in greater detail with reference to the drawings. Although certain embodiments of the present disclosure are shown in the Figures, it should be understood that the present disclosure may be achieved in various forms and should not be construed as being limited to the embodiments described herein; on the contrary, these embodiments are provided to allow a more thorough and fuller understanding of the present disclosure. It should be understood that the drawings and embodiments of the present disclosure are only intended for illustrative purposes, instead of limiting the protection scope of the present disclosure.

[042] In the description of an embodiment of the present disclosure, the term "comprise" and similar terms should be understood as open inclusion, namely, "including, but not limited to,". The term "based on" should be understood as "at least partially based on". The term "an embodiment" or "the embodiment" should be understood as "at least one

embodiment". The term "certain embodiments" should be understood as "at least certain embodiments". The term "user" of a vehicle refers to a person who uses a vehicle, who may be a driver or passenger of a vehicle. Other explicit or implied definitions may further be included below.

[043] As described above, the assisted driving functions or automatic driving functions of vehicles currently available on the market provide the same set of parameters; for example, in terms of the assisted brake function, all the vehicles provide a driver with assistance in braking when a following distance is shorter than a certain distance; however, people's habits and preferences vary; for example, some people do not like emergency braking; therefore, the existing assisted driving functions provide poor user experience and are not sufficiently individual. An improvement on the conventional method is selection of a corresponding driving mode, for example, a common mode or a motion mode, based on the personal information, including age and gender, on persons in a vehicle; however, on the one hand, since only a few driving modes are provided, unable to meet different needs of numerous users, the provided functions are not individual enough; on the other hand, personal information does not show any actual driving preferences of a person in a vehicle; for example, persons of the same age may have different driving preferences; therefore, such an improvement still cannot provide genuinely individual driving experience.

[044] For this reason, an embodiment of the present disclosure proposes a new solution to providing individual driving experience. According to an embodiment of the present disclosure, driving behaviour data of each user in respective vehicle are collected, and then assisted driving or automatic driving of the current vehicle is controlled on the basis of respective driving behaviour data, so that a user is given a feeling that he/she is driving himself/herself, and thus the user's individual driving experience is improved. It should be understood that a method according to an embodiment of the present disclosure is intended not to change a user, but to change control over the current vehicle so that the current vehicle is more adaptable to a user's driving habit and style. Certain demonstrative embodiments of the present disclosure will be described below in detail with reference to Figs. 1 – 8.

[045] Fig. 1 shows an exemplary environment 100 in which individual driving experience is provided according to an embodiment of the present disclosure. As shown in Fig. 1, when the user 111 drives the vehicle 121, the driving behaviour data 131 of the user 111 may be collected and stored in the driving behaviour server 130. The stored driving behaviour data 131 may provide the user 111 with individual experience when the user drives or rides the current vehicle 122 in the future. In the example shown in Fig. 1, the vehicle 122, for example, may be an automatic driving vehicle, and the user 111 sits in a seat on the back row of the vehicle 122. In the conventional method, the automatic driving procedure of the vehicle 122 drives the vehicle 122 in a predetermined uniform

mode or a mode selected from several modes (such as a common mode and a motion mode); a driving style provided by this method cannot meet the individual needs of various users. In contrast, in an embodiment of the present disclosure, the vehicle 122 is instructed to automatically drive according to the first driving behaviour data 131 of the user 111 collected when he/she drove the vehicle 121 himself/herself; thus, the vehicle 122 is driven automatically as if it is being driven by the user 111 himself/herself, and the driving experience of the user 111 is greatly improved.

[046] The first driving behaviour data 131 may be data collected during a period or throughout when the user 111 drives the vehicle 121, and may be sent in real time, periodically, or consistently to the driving behaviour server 130 for storage. In certain embodiments, the first driving behaviour data 131 may include, but are not limited to, accelerator data, braking data, and steering dodge range; in addition, the first driving behaviour data 131 may further include external images, radar data, and global positioning data collected by various collection devices of the vehicle 121.

[047] Fig. 2 is a flowchart for a method 200 for providing individual driving experience according to an embodiment of the present disclosure. It should be understood that the method 200 according to an embodiment of the present disclosure may be executed by a local device in the vehicle 122 described with reference to Fig. 1, or may be executed by the server 130 (the server 130, in addition to storing driving behaviour data, may also comprise an automatic driving model) or a cloud device, or may be executed partially in the vehicle 122 locally and partially on the server 130.

[048] In block 202, the first driving behaviour data of the first user collected from at least one vehicle are obtained, wherein the first driving behaviour data includes the operational data of the first user collected from his/her operation on at least one mentioned vehicle, for example, user driving data of the user 111 collected from his/her operation on the vehicle 111, or user operational data of the user 111 collected from his/her operation on the unmanned vehicle 111. In certain embodiments, driving behaviour data of a user may be collected from a vehicle. Alternatively, driving behaviour data of a user may also be collected from a plurality of vehicles, for example, a plurality of vehicles that the user has used.

[049] For example, the vehicle 122 described with reference to Fig. 1 obtains, from the driving behaviour server 130, the first driving behaviour data 131 of the user 111 collected from the vehicle 121. If the vehicle 122 is an assisted driving vehicle or a partially automated driving vehicle, then the user 111 may be the driver of the vehicle 122; if the vehicle 122 is a highly automated driving vehicle or a fully automated driving vehicle, then the user 111 may be a passenger of the vehicle 122, and may even be not in the driver's seat (as shown in Fig. 1, the user 111 sits in a seat on the back row of the vehicle 122). In certain embodiments, the vehicle 122, after verifying the identity of the user 111, identifies his/her user identifier, for example, a user account, and then obtains,

from the server 130, the first driving behaviour data 131 of the verified user 111.

[050] Optionally, in block 204, the first driving habit of the first user is identified on the basis of the first driving behaviour data of the first user. For example, the vehicle 122 may immediately learn the driving habit and style of the user 111; when a driving habit is identified, certain noise data and/or irrational and/or nonconforming data may be removed. It should be understood that any methods for driving behaviour analysis that are known or will be developed may be used in combination with an embodiment of the present disclosure. In an example, the vehicle 122 may learn that the user 111 has a relatively steady driving style of driving at relatively low speeds, avoiding sudden acceleration and frequent lane changes, and keeping relatively long following distances. It should be understood that, in certain situations, the current vehicle may also be directly controlled to provide individual driving experience for the first user based on the first driving behaviour data of the first user, without the need for identifying a driving habit of the user.

[051] In block 206, the current vehicle is controlled to provide individual driving experience for the first user. For example, a control device or computation device in the vehicle 122, based on the first driving behaviour data 131 of the user 111, identifies his/her driving habit, and then drives the vehicle 122 at a relatively steady and low speed, thereby providing the user 111 with individual experience. On the contrary, if the vehicle 122 is driven fast, then the user 111 may feel uncomfortable and be unaccustomed to it. In certain embodiments, the current vehicle that a user is driving or riding may be different from at least one vehicle from which driving behaviour data is collected. Alternatively, the current vehicle that a user is driving or riding may also be the same as at least one vehicle from which driving behaviour data is collected.

[052] Therefore, in the method 200 according to an embodiment of the present disclosure, respective driving habits of each user are identified on the basis of driving behaviour data of each user collected from respective vehicles. Then, assisted driving or automatic driving of the current vehicle is controlled on the basis of respective driving habits, so that a user is given a feeling that he/she is driving himself/herself, and thus users' individual driving experience is improved.

[053] In certain embodiments, the vehicle 122 may be an assisted driving vehicle or a partially automated driving vehicle; therefore, the adaptive cruise, lane keeping assist, and/or automatic emergency braking functions, etc. of the vehicle 122 may be controlled on the basis of a driving habit of the user 111. In this manner, in an assisted driving scene, the user's driving experience may also be improved, and thus the applicable scope of embodiments of the present disclosure is expanded.

[054] Alternatively, the vehicle 122 may be a fully automated driving vehicle and, therefore, the fully automated driving process of the vehicle 122 may be controlled on the basis of a driving habit of the user 111. In this manner, in the fully automated driving

process, the automatic driving vehicle 122 may still give the user 111 delight and pleasure the same as that of driving himself/herself, thus improving the user experience. An exemplary classification of automatic driving levels may include six levels: L0, no automatic configuration, at which the driver drives the vehicle himself/herself, without any active safety configurations; L1, driving assistance, at which the vehicle provides certain functions that assist the driver in performing specific tasks of transverse or lengthwise vehicle motions (but not completing, at the same time, complicated tasks, for example, changing lanes and overtaking), and the driver still completes most of the vehicle control functions; L2, advanced driving assistance, at which the vehicle may have certain abilities to assist the driver in performing tasks of transverse and lengthwise vehicle motions (the vehicle being able to autonomously perform specific complicated tasks), but the driver needs to monitor the vehicle in real time to ensure that it completes these tasks; L3, automatic driving in a specific scene, at which, when the vehicle travels dynamically, as permitted by the user, the automatic driving system may intervene in the vehicle travel as a whole, and the user may, at any time, correct any errors that have occurred during automatic driving of the vehicle; L4, advanced automatic driving, at which, when the vehicle is travelling, all operations are completed by the automatic driving system; in a scene of implementation, if the vehicle shows no illogicalities, no user intervention is needed; and L5, at which, the vehicle will reach a destination by automatic driving without user intervention, regardless of whether it is in a specific scene of implementation or not.

[055] In certain embodiments, the vehicle 122 is of a higher automatic driving level than the vehicle 121. Alternatively, the vehicle 122 and the vehicle 121 are of the same automatic driving level, but the vehicle 122 provides more assisted driving functions than the vehicle 121. Operational data of the user 111 from his/her operation on the vehicle 121 may be collected. In this manner, driving behaviour data of a user from his/her operations on automatic driving vehicles having different levels or different functions may be collected; with increases in the automatic driving levels or functions of driven vehicles, data of automatic driving vehicles having higher levels or functions in more complicated work conditions continue to be collected, and driving behaviour data and driving habit data of users are improved continuously; thus, driving behaviour databases are enriched to further improve the individual driving experience of users.

[056] Fig. 3 shows another exemplary environment 300 in which individual driving experience is provided according to an embodiment of the present disclosure. Compared with that in Fig. 1, the driving behaviour server 130 further stores the driving behaviour data 132 of another user 112 collected from his/her operation on the vehicle 123. Then, when the user 112 rides the automatic driving vehicle 122, the vehicle 122 obtains, from the driving behaviour server 130, the driving behaviour data 132 of the user 112, and accordingly identifies a driving habit of the user 112. Different from the user 111, the

user 112 has a driving habit characterised by high speeds, rapid acceleration, rapid braking, and relatively short following distances, thus controlling the unmanned vehicle 122 to travel at a relatively high speed. In this manner, even if different users, such as the user 111 shown in Fig. 1 and the user 112 shown in Fig. 3, ride the same vehicle (the vehicle 122), they may respectively gain different driving experiences provided on the basis of respective historical driving habits, and therefore driving needs of different persons are satisfied.

[057] In certain embodiments, the vehicle 122 may verify the identity of a person in the vehicle by biometric identification and/or account login, etc., and obtain the corresponding driving behaviour data from the driving behaviour server 130 only after the identity is verified. Biometric identification may comprise fingerprint identification, facial recognition, and vocal print identification, wherein fingerprint identification refers to verification by a fingerprint collected from a user, facial recognition refers to capturing of an image of the face of a user in the vehicle by an on-board camera, and vocal print identification refers to collection of the voice of a user in the vehicle by an on-board microphone. Verification of user identity by biometric identification allows an increase in user verification efficiency, thereby decreasing unnecessary login burden placed on a user. Alternatively, a user may also log in by entering an account number and a password on a graphical user interface provided in the vehicle 122; thus, user verification is completed and the user's historical driving behaviour data collected.

[058] Fig. 4 shows yet another exemplary environment 400 in which individual driving experience is provided according to an embodiment of the present disclosure. In the example shown in Fig. 4, different from the example shown in Fig. 3 (as shown in Fig. 3, a plurality of users may share the same unmanned vehicle, for example, a taxi), each user has respective current vehicle (for example, the vehicle 122 and the vehicle 124 may be the private vehicles of the user 111 and the user 112, respectively); for example, the user 111 is riding his/her current vehicle 122, and the user 112 is riding his/her current vehicle 124; based on the driving behaviour data 131 and 132, the vehicle 122 and the vehicle 124 may be respectively controlled to travel in correspondence to the driving habits of the user 111 and the user 112, respectively.

[059] Fig. 5 is a block diagram for an exemplary architecture of an on-board driving assistance system 500 according to an embodiment of the present disclosure. For example, the on-board driving assistance system 500 may be an advanced driving assistance system (ADAS), which may be deployed in the vehicle 121 as shown in Fig. 1 to collect a user's driving behaviour data.

[060] As shown in Fig. 5, the on-board driving assistance system 500 comprises an image capturing device 510 (for example, a camera), a radar device 520 (for example, laser radar), a global positioning system 530 (for example, the Global Positioning System, namely, the GPS), an accelerator sensor 540, a brake sensor 550, a steering sensor 560,

an electronic control unit (ECU) 570, a performer 580, and a communication module 590, wherein the performer is used to, based on the ECU 570, handle collected data and perform predetermined tasks, and these tasks may include, but are not limited to, adaptive cruise, lane deviation warning, lane keeping assist, pedestrian protection, automatic parking, and electric vehicle warning. According to an embodiment of the present disclosure, the vehicle 121 may collect the driving behaviour data 131 of the user 111 by its on-board driving assistance system 500 and, by the communication module 590, send the driving behaviour data 131 to the driving behaviour server 130 for storage.

[061] The image capturing device 510 may comprise a front-view camera and a rear-view camera, wherein the front-view camera analyses video contents to provide functions including lane deviation warning (LDW), automatic lane keeping assist (LKA), high beam/low beam control, and traffic sign recognition (TSR), and the rear-view camera may allow the driver to see any objects or persons behind the vehicle, thereby reversing safely and parking properly. The radar device 520 supports adaptive cruise, anti-collision protection, a collision warning system, etc., with or without automatic steering and braking intervention functions. In a collision warning system, a radar chipset allows detection and tracking of a target, automatic adjustment of vehicle speeds and control of distances from a vehicle ahead based on the traffic conditions ahead, and, in case of an imminent collision, sending of a warning to the driver and starting of emergency braking intervention. The global positioning system 530 is used to acquire and record position information about a vehicle. According to an embodiment of the present disclosure, information collected by the image capturing device 510, the radar device 520, and the global positioning system 530 may be stored as a part of driving behaviour data.

[062] The accelerator sensor 540, the brake sensor 550, and the steering sensor 560 are respectively used to collect information on an accelerator position, a brake position, and a steering wheel position when a user drives the vehicle, and such data may be stored as part of driving behaviour data. In certain embodiments, various types of driving behaviour parameters may be stored in predetermined fixed formats, and data of each user may be stored in association with their account numbers. When a user has the vehicle replaced or uses another vehicle that is of a higher automatic driving level, after he/she simply transfers collected individual driving behaviour data to the new vehicle, the new vehicle will immediately learn the driving habits and behaviours of the vehicle user and be driven according to the individual preferences. In addition, in the vehicle 122 shown in Fig. 1, the on-board driving assistance system 500 according to an embodiment of the present disclosure may also be deployed, or a system more advanced than the on-board driving assistance system 500 may be deployed.

[063] Generally, the same driver may show different driving behaviours in different scenes, for example, generally driving more slowly on a rainy day than on a sunny day. In certain embodiments, scenes may be differentiated in one or more of the following

aspects: weather conditions, road type, time intervals, and area type; in addition, driving behaviour data of users are collected in different scenes, respectively; thus, driving behaviour data that are more fine-grained may be obtained, which facilitates subsequent driving behaviour analysis and automatic driving control, thereby further improving a user's driving experience in the current vehicle. Scenes may be divided into sunny day, rainy day, snowy day, etc., by weather conditions, may be divided into straight-going road, turn lead-in, crossroads, etc. by road type, may be divided into day, night, morning, dusk, etc. by time intervals, and may be divided into city, suburb, countryside, etc. by area type.

[064] Fig. 6A shows a schematic diagram for a scene on a sunny day 600 in which individual driving experience is provided according to an embodiment of the present disclosure. In the sunny day scene 600, with the sun 610 high in the sky, high visibility, and the ground generally not wet or skiddy, the automatic driving system may control the vehicle 122 to maintain at least the first distance 630 from the vehicle ahead 620. Fig. 6B shows a schematic diagram for a scene on a rainy day 650 in which individual driving experience is provided according to an embodiment of the present disclosure. In the rainy day scene 650, with rain coming down from the cloud 660 and wetting the ground, the automatic driving system may control the vehicle 122 to maintain at least the second distance 670 from the vehicle ahead 620. The user 111 generally maintains a following distance longer on a rainy day than on a sunny day when driving himself or herself; therefore, accordingly, when the vehicle 122 is driven for the user 111, the distance 670 maintained on a rainy day may be made longer than the distance 630 maintained on a sunny day. In this manner, automatic driving functions become more humanised, and users' driving experience is further improved.

[065] In certain embodiments, an average speed at which the user 111 drives the vehicle 121 on a highway may also be determined; then, when the automatic driving vehicle 122 travels on a highway, the automatic driving of the vehicle 122 is controlled on the basis of this average speed. In this manner, the automatic driving of a vehicle is made more suitable to speeds at which the user drives, thereby improving user satisfaction.

[066] Fig. 7 is a flowchart for a method 700 for handling driving feedback from a user according to an embodiment of the present disclosure. It should be understood that the method 700 described in Fig. 7 may be executed after the method 200. In block 702, the vehicle 122 is controlled to provide the user 111 with individual driving experience in correspondence to his/her driving habit. In block 704, whether or not any driving feedback from the user 111 has been received in the vehicle 122 is judged; for example, the user 111 may give driving feedback by voice, for example, by saying, "slow down". If no feedback has been received from the user 111, then a return is made to the block 702 to continue controlling vehicle driving. If user feedback is received in block 704, then, in block 706, control of the vehicle 122 being ridden is adjusted, for example, by causing

the vehicle 122 to slow down. Next, in block 708, driving environment data of the vehicle 122 within a period before the driving feedback made by the user 111 are collected, and in block 710, the automatic driving algorithm is modified on the basis of the collected driving environment data. In this manner, user feedback may be handled and

predetermined mode parameters modified, so that the automatic driving or assisted driving function becomes more intelligent and accurate. In addition, algorithm iteration of the intelligent driving system may also be promoted by user feedback, and thus the automatic driving algorithm is modified automatically by user feedback.

[067] Fig. 8 is a schematic diagram for an exemplary device 800 that may be used to implement an embodiment of the present disclosure. It should be understood that the device 800 may be included in the vehicle 122 as described in Fig. 1 or be the server 130. As shown in the figure, the device 800 comprises a central processing unit (CPU) 801, which may, according to a computer program instruction stored in a Read-Only Memory (ROM) 802 or a computer program instruction loaded from a storage unit 808 to a

Random Access Memory (RAM) 803, execute various appropriate actions and handling. In the RAM 803, various procedures and data required for operating the storage device 800 may also be stored. The CPU 801, the ROM 802, and the RAM 803 are connected to one another by a bus 804. An input/output (I/O) port 805 is also connected to the bus 804. [068] A plurality of components in the device 800 are connected to the I/O port 805, including an input unit 806, for example, a keyboard or a mouse; an output unit 807, for example, one of various types of displays or speakers; a storage unit 808, for example, a magnetic disk or a CD-ROM; and a communication unit 809, for example, a network adapter, a modem, or wireless communication transceiver. The communication unit 809 allows the device 800 to exchange information/data with another device by a computer network, for example, the Internet, and/or various telecommunication networks.

[069] The CPU 801 executes each of the methods and processes described above, for example, the method 200 and/or 700. For example, in certain embodiments, a method may be implemented as a computer software program that is tangibly included in a machine-readable medium, for example, the storage unit 808. In certain embodiments, a computer program may, in part or in whole, be loaded into and/or installed on the device 800 by the ROM 802 and/or the communication unit 809. A computer program, when loaded into the RAM 803 and executed by the CPU 801, may execute one or more of the actions or steps in the above-described method. Alternatively, in other embodiments, the CPU 801 may be configured to execute a method in any other appropriate manner, for example, by firmware.

[070] The functions described above herein may, at least partially, be executed by one or more hardware logic components. For example, exemplary types of useable hardware logic components include, but not limited to, field programmable gate array (FPGA), application-specific integrated circuit (ASIC), Application Specific Standard Product

(ASSP), System on Chip (SOC) system, and Complex Programmable Logic Device (CPLD).

[071] Program codes used to implement a method of the present disclosure may be written in any combination of one or more programming languages. These program

codes may be provided to a processor or controller of a general-purpose computer, a dedicated computer, or any other programmable data processing device, so that a program code, when executed by the processor or controller, causes the functions/operations as specified in a flowchart and/or block diagram to be performed. A program code may be executed fully in a machine, executed partially in a machine, executed partially in a machine as a standalone software package and executed partially in a remote machine or executed fully in a remote machine or server.

[072] In the context of the present disclosure, a machine-readable medium may be a tangible medium, which may contain or store a program to be used by an instruction execution system, apparatus, or device, or used in combination with an instruction execution system, apparatus, or device. A machine-readable medium may be a machine-readable signal medium or a machine-readable storage medium.

Machine-readable mediums may include, but are not limited to, electronic, magnetic, optical, electromagnetic, infrared, or semiconductor systems, or any appropriate combination thereof. More specific examples of machine-readable mediums may include an electrical connection based on one or more wires, a portable computer disk, a hard disk, a Random Access Memory (RAM), a Read-Only Memory (ROM), an Electrically Erasable Programmable Read-Only Memory (EPROM or flash memory), an optical fibre, a Compact Disc Read-Only Memory (CD-ROM), an optical storage device, and a magnetic storage device, or any appropriate combination thereof.

[073] In addition, although various actions or steps are described in a specific order, this should be understood as requiring such actions or steps to be performed in the shown specific order or sequentially, or as requiring all the illustrated actions or steps to be performed to achieve desired results. In a specific environment, multitasking and parallel processing may be favourable. Likewise, although the preceding description contains certain specific implementation details, these details should not be construed as limiting the scope of the present disclosure. Certain characteristics described in the context of separate embodiments may also be implemented in combination in a single implementation. Conversely, various characteristics described in the context of a single implementation may also be implemented in a plurality of implementations separately or in any appropriate sub-combinations.

[074] While embodiments of the present disclosure have been described above with words specific to structure characteristics and/or logic actions of methods, it should be understood that the subject defined in the attached claims is not necessarily limited to the above-described specific characteristics or actions. On the contrary, the

5 above-described specific characteristics and actions are only exemplary forms of implementing the claims.

Claims

- 5
1. A method for providing individual driving experience (200), comprising:
obtaining (202) the first driving behaviour data (131) of the first user (111) collected from
at least one vehicle (121), wherein the first driving behaviour data (131) includes the
operational data of the first user (111) collected from his/her operation on at least one
10 mentioned vehicle (121); and
controlling (206) the current vehicle (121, 122) to provide individual driving experience to
the first user (111) based on the first driving behaviour data (131) of the first user (111).
- 15
2. The method (200) according to Claim 1, wherein the controlling (206) of the current vehicle
(121, 122) to provide individual driving experience to the first user (111) comprises:
identifying (204) the first driving habit of the first user (111) based on the first driving
behaviour data (131) of the first user (111); and
controlling (206) the current vehicle (121, 122) to provide individual driving experience in
correspondence to the first driving habit to the first user (111).
- 20
3. The method (200) according to Claim 1, wherein the current vehicle (122) is different from at
least one mentioned vehicle (121) and the current vehicle (122) is of a higher automatic driving
level than at least one mentioned vehicle (121), or the current vehicle (122) and at least one
mentioned vehicle (121) have the same automatic driving level and the current vehicle (122)
25 has more driving assistance systems than at least one mentioned vehicle (121), also
comprising:
collecting the operational data of the first user (111) from his/her operation on the
current vehicle (122).
- 30
4. The method (200) according to Claim 2, also comprising:
identifying the second driving habit of the second user (112) based on the second driving
behaviour data (132) of the second user (112) collected from his/her operation on a
vehicle (121, 123), wherein the second driving habit is different from the first driving habit
in at least one of the following aspects: driving speed, following distance, acceleration
35 control, and brake control; and
controlling the current vehicle (121, 122) to provide individual driving experience in
correspondence to the second driving habit to the second user (112).

5. The method (200) according to Claim 1, wherein the obtaining (202) of the first driving behaviour data (131) of the first user (111) collected from at least one mentioned vehicle (121) comprises:

- 5 in response to the first user's (111) entering the current vehicle (121, 122), verifying the first identity of the first user (111) by biometric identification or account login;
in response to the mentioned first identity being verified, identifying the first identifier of the first user (111); and
obtaining the first driving behaviour data (131) from a driving behaviour server (130)
10 based on the first identifier of the first user (111), wherein the driving behaviour server (130) stores the driving behaviour data (131, 132) of a plurality of users (111, 112) collected through on-board driving assistance systems (500) and the on-board driving assistance systems (500) include an image capturing device (510), a radar device (520), and a GPS system (530).

15

6. The method (200) according to Claim 2, wherein the obtaining (202) of the first driving behaviour data (131) of the first user (111) collected from at least one mentioned vehicle (121) comprises:

- obtaining the first scene data collected from the first user's (111) operation on at least
20 one mentioned vehicle (121) in the first scene (600); and
obtaining the second scene data collected from the first user's (111) operation on at least one mentioned vehicle (121) in the second scene (650), wherein the first scene (600) is differentiated from the second scene (650) in at least one of the following aspects: weather conditions, road type, time intervals, and area type.

25

7. The method (200) according to Claim 6, wherein the controlling (206) of the current vehicle (121, 122) to provide individual driving experience in correspondence to the first driving habit to the first user (111), comprises:

- in response to the first user's (111) riding the current vehicle (121, 122) in the first scene (600), controlling the current vehicle (121, 122) to maintain at least the first distance (630) with the vehicle ahead (620); and
30 in response to the first user's (111) riding the current vehicle (121, 122) in the second scene (650), controlling the current vehicle (121, 122) to maintain at least the second distance (670) with the vehicle ahead (620), wherein the first scene (600) is in a sunny day and the second scene (650) is in a rainy day and the first distance (630) is shorter
35 than the second distance (670).

8. The method (200) according to Claim 2, wherein the controlling (206) of the current vehicle (121, 122) to provide individual driving experience in correspondence to the first driving habit to the first user (111), comprises:

identifying the average speed at which the first user (111) drives at least one mentioned vehicle (121) on a highway; and
in response to the current vehicle's (121, 122) driving on the highway, controlling the automatic driving of the current vehicle (121, 122) on the highway based on the average speed.

9. The method (200) according to Claim 2, wherein the controlling (206) of the current vehicle (121, 122) to provide individual driving experience in correspondence to the first driving habit to the first user (111), comprises:

in response to the driving feedback (704) from the first user (111), adjusting (706) the driving control to the current vehicle (121, 122);
collecting (708) the driving environment data of the current vehicle (121, 122) within a predetermined period before the driving feedback made; and
modifying the automatic driving algorithm (710) based on the collected driving environment data.

10. The method (200) according to Claim 2, wherein the controlling (206) of the current vehicle (121, 122) to provide individual driving experience in correspondence to the first driving habit to the first user (111), comprises:

in response to the current vehicle (121, 122) as an assisted driving vehicle or a partially automated driving vehicle, controlling at least one of the following functions of the current vehicle (121, 122) according to the first driving habit: adaptive cruise, lane keeping assist, and automatic emergency braking.

11. The method (200) according to Claim 2, wherein the controlling (206) of the current vehicle (121, 122) to provide individual driving experience in correspondence to the first driving habit to the first user (111), comprises:

in response to the current vehicle (121, 122) as a fully automatic driving vehicle, controlling the fully automatic driving process of the current vehicle (121, 122) according to the first driving habit.

12. A device (800) for providing individual driving experience, comprising:

at least one processing unit (801); and

at least one memory (802, 803), wherein the memory (802, 803) is coupled to at least one mentioned processing unit (801) and stores instructions for execution by at least one

mentioned processing unit (801); wherein the execution of instructions by at least one mentioned processing unit (801) causes the device (800) to perform actions comprising: obtaining (202) the first driving behaviour data (131) of the first user (111) collected from at least one vehicle (121), wherein the first driving behaviour data (131) includes the operational data of the first user (111) collected from his/her operation on at least one mentioned vehicle (121); and controlling (206) the current vehicle (121, 122) to provide individual driving experience to the first user (111) based on the first driving behaviour data (131) of the first user (111).

13. The device (800) according to Claim 12, wherein the controlling (206) of the current vehicle (121, 122) to provide individual driving experience to the first user (111) comprises: identifying (204) the first driving habit of the first user (111) based on the first driving behaviour data (131) of the first user (111); and controlling (206) the current vehicle (121, 122) to provide individual driving experience in correspondence to the first driving habit to the first user (111).

14. The device (800) according to Claim 12, wherein the current vehicle (122) is different from at least one mentioned vehicle (121) and the current vehicle (122) is of a higher automatic driving level than at least one mentioned vehicle (121), or the current vehicle (122) and at least one mentioned vehicle (121) have the same automatic driving level and the current vehicle (122) has more driving assistance systems than at least one mentioned vehicle (121), whose actions also comprise: collecting the operational data of the first user (111) from his/her operation on the current vehicle (122).

15. The device (800) according to Claim 13, whose actions also comprise: identifying the second driving habit of the second user (112) based on the second driving behaviour data (132) of the second user (112) collected from his/her operation on a vehicle (121, 123), wherein the second driving habit is different from the first driving habit in at least one of the following aspects: driving speed, following distance, acceleration control, and brake control; and controlling the current vehicle (121, 122) to provide individual driving experience in correspondence to the second driving habit to the second user (112).

16. The device (800) according to Claim 12, wherein the obtaining (202) of the first driving behaviour data (131) of the first user (111) collected from at least one mentioned vehicle (121) comprises: in response to the first user's (111) entering the current vehicle (121, 122), verifying the first identity of the first user (111) by biometric identification or account login;

in response to the mentioned first identity being verified, identifying the first identifier of the first user (111); and

obtaining the first driving behaviour data (131) from a driving behaviour server (130) based on the first identifier of the first user (111), wherein the driving behaviour server (130) stores the driving behaviour data (131, 132) of a plurality of users (111, 112) collected through on-board driving assistance systems (500) and the on-board driving assistance systems (500) include an image capturing device (510), a radar device (520), and a GPS system (530).

10 17. The device (800) according to Claim 13, wherein the obtaining (202) of the first driving behaviour data (131) of the first user (111) collected from at least one mentioned vehicle (121) comprises:

obtaining the first scene data collected from the first user's (111) operation on at least one mentioned vehicle (121) in the first scene (600); and

15 obtaining the second scene data collected from the first user's (111) operation on at least one mentioned vehicle (121) in the second scene (650), wherein the first scene (600) is differentiated from the second scene (650) in at least one of the following aspects: weather conditions, road type, time intervals, and area type.

20 18. The device (800) according to Claim 17, wherein the controlling (206) of the current vehicle (121, 122) to provide individual driving experience in correspondence to the first driving habit to the first user (111) comprises:

in response to the first user's (111) riding the current vehicle (121, 122) in the first scene (600), controlling the current vehicle (121, 122) to maintain at least the first distance (630) with the vehicle ahead (620); and

25 in response to the first user's (111) riding the current vehicle (121, 122) in the second scene (650), controlling the current vehicle (121, 122) to maintain at least the second distance (670) with the vehicle ahead (620), wherein the first scene (600) is in a sunny day and the second scene (650) is in a rainy day and the first distance (630) is shorter than the second distance (670).

19. The device (800) according to Claim 13, wherein the controlling (206) of the current vehicle (121, 122) to provide individual driving experience in correspondence to the first driving habit to the first user (111) comprises:

35 identifying the average speed at which the first user (111) drives at least one mentioned vehicle (121) on a highway; and

in response to the current vehicle's (121, 122) driving on the highway, controlling the automatic driving of the current vehicle (121, 122) on the highway based on the average speed.

20. The device (800) according to Claim 13, wherein the controlling (206) of the current vehicle (121, 122) to provide individual driving experience in correspondence to the first driving habit to the first user (111) comprises:

5 in response to the driving feedback (704) from the first user (111), adjusting (706) the driving control to the current vehicle (121, 122);
collecting (708) the driving environment data of the current vehicle (121, 122) within a predetermined period before the driving feedback made; and
10 modifying the automatic driving algorithm (710) based on the collected driving environment data.

21. The device (800) according to Claim 13, wherein the controlling (206) of the current vehicle (121, 122) to provide individual driving experience in correspondence to the first driving habit to the first user (111) comprises:

15 in response to the current vehicle (121, 122) as an assisted driving vehicle or a partially automated driving vehicle, controlling at least one of the following functions of the current vehicle (121, 122) according to the first driving habit: adaptive cruise, lane keeping assist, and automatic emergency braking.

22. The device (800) according to Claim 13, wherein the controlling (206) of the current vehicle (121, 122) to provide individual driving experience in correspondence to the first driving habit to the first user (111) comprises:

20 in response to the current vehicle (121, 122) as a fully automatic driving vehicle, controlling the fully automatic driving process of the current vehicle (121, 122) according
25 to the first driving habit.

23. A computer readable storage medium, on which a computer program is stored, wherein the execution of the program implements the methods (200) according to any of Claims 1-11.

30 24. A vehicle (122, 124), which comprises devices (600) for providing individual driving experience according to any of Claims 12-22.

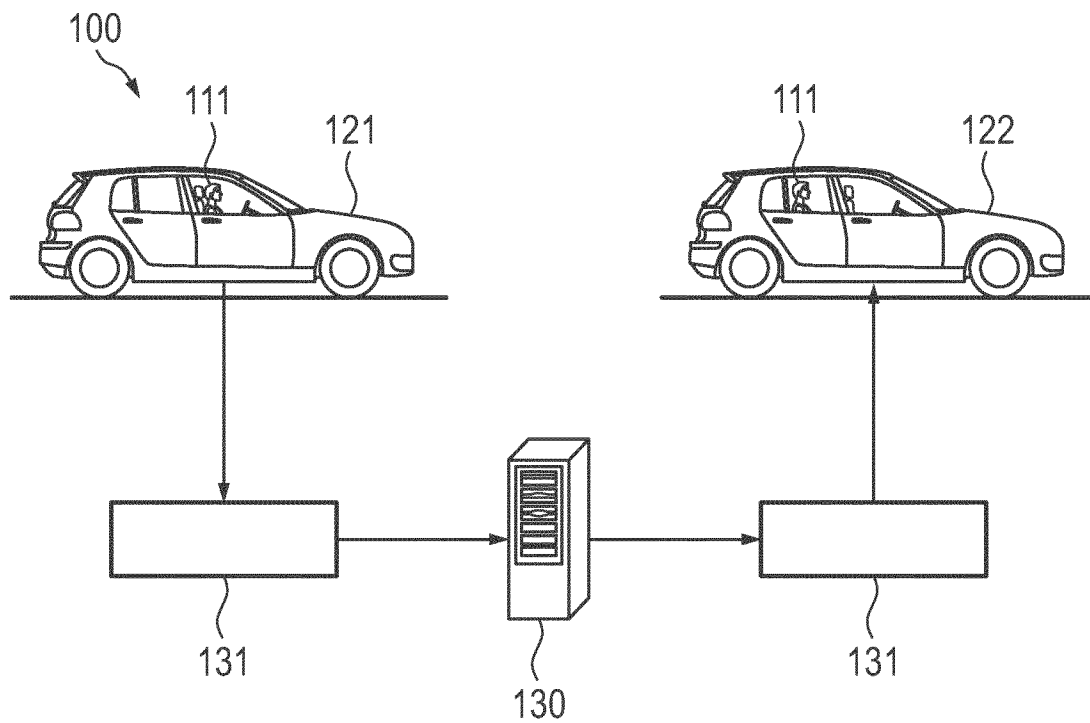


Fig. 1

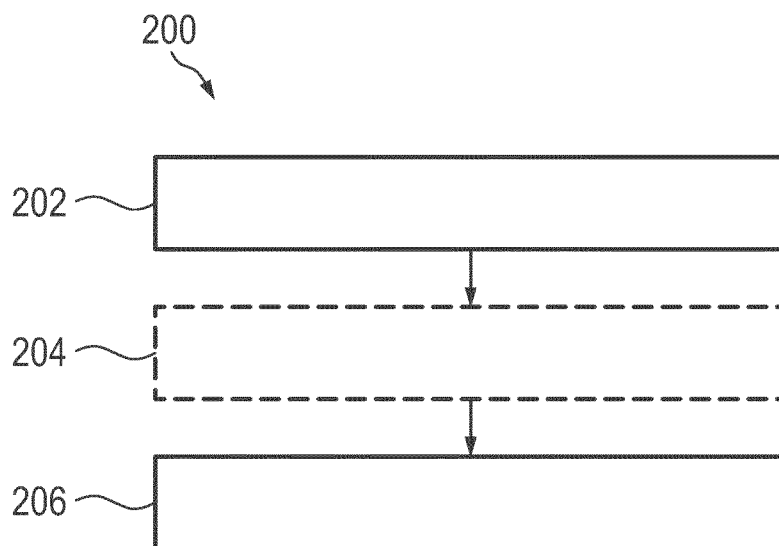


Fig. 2

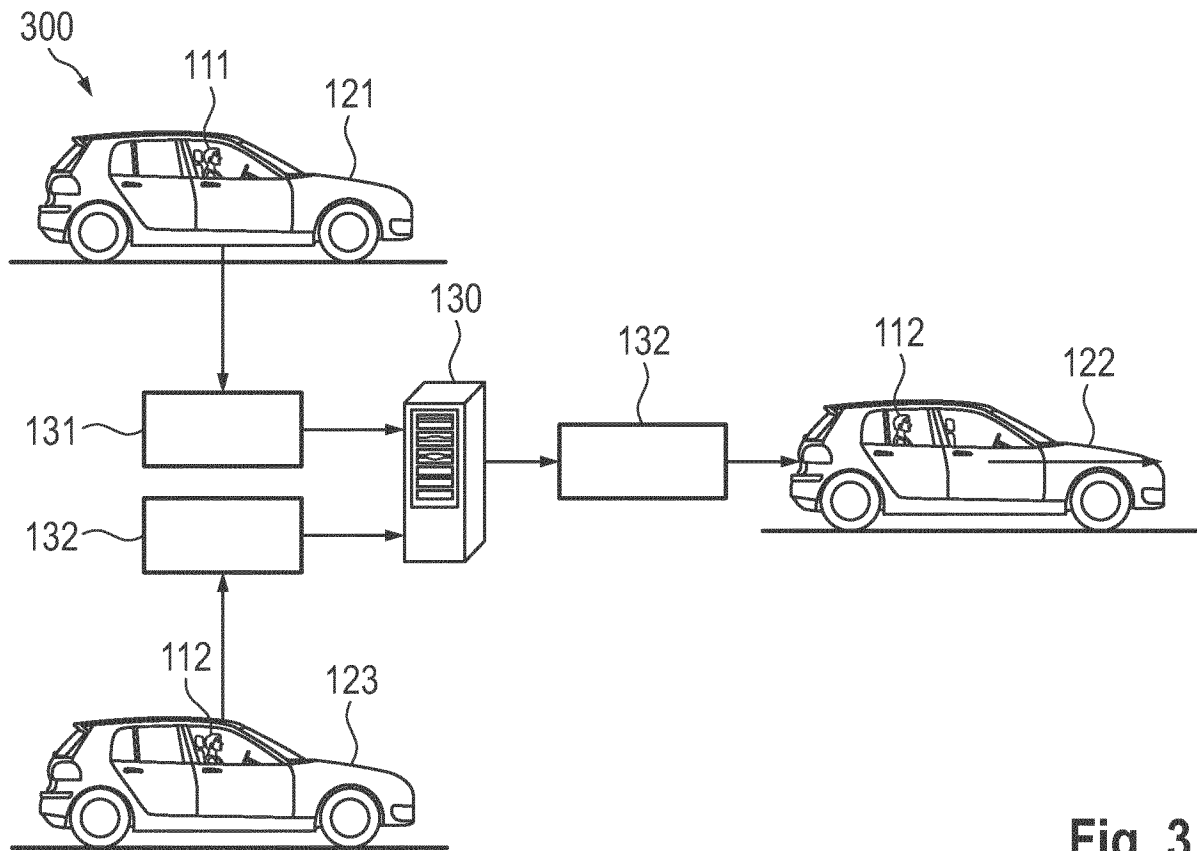


Fig. 3

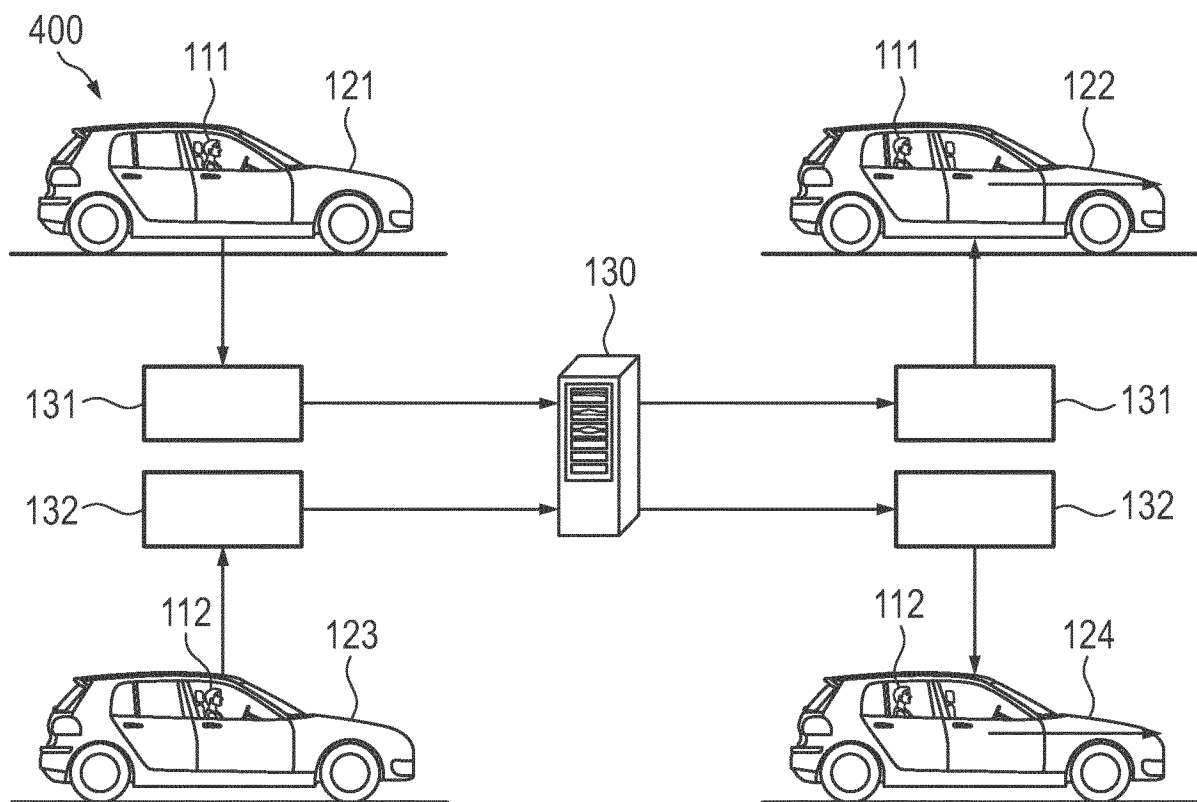
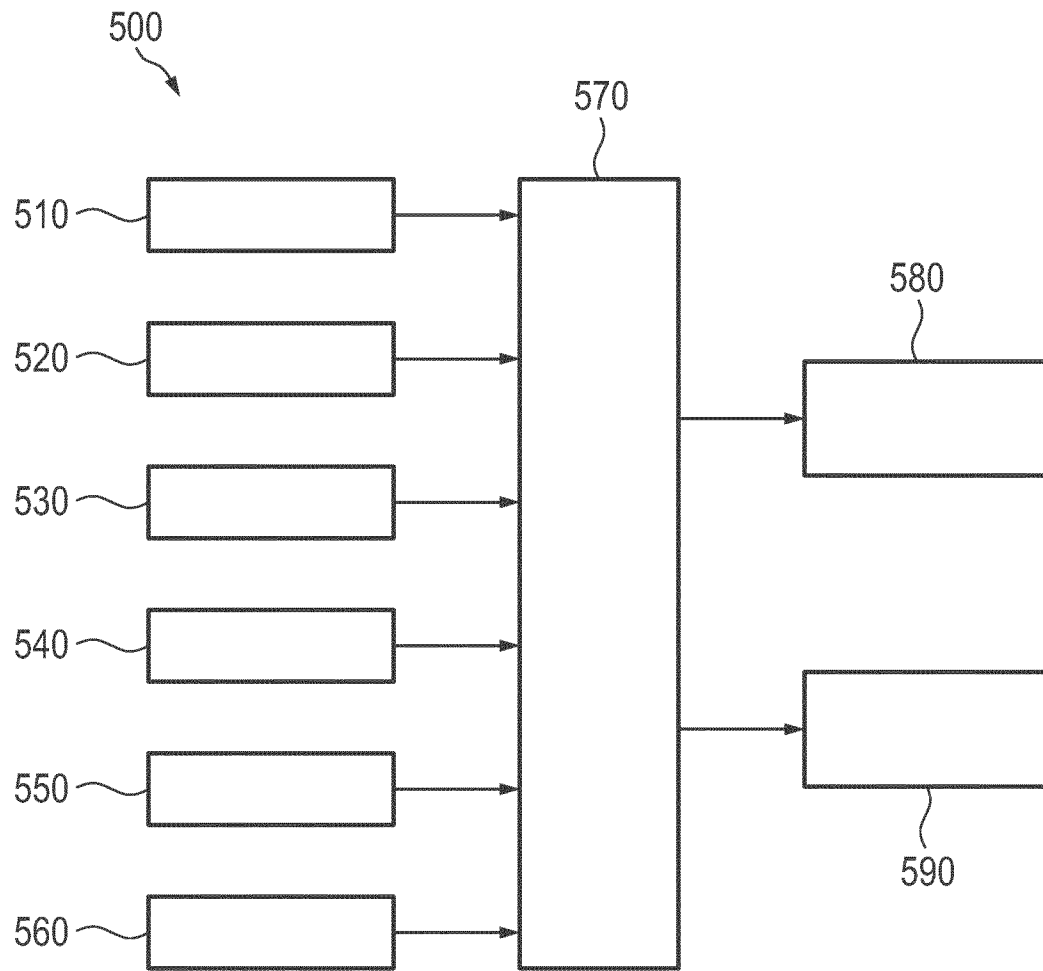


Fig. 4

**Fig. 5**

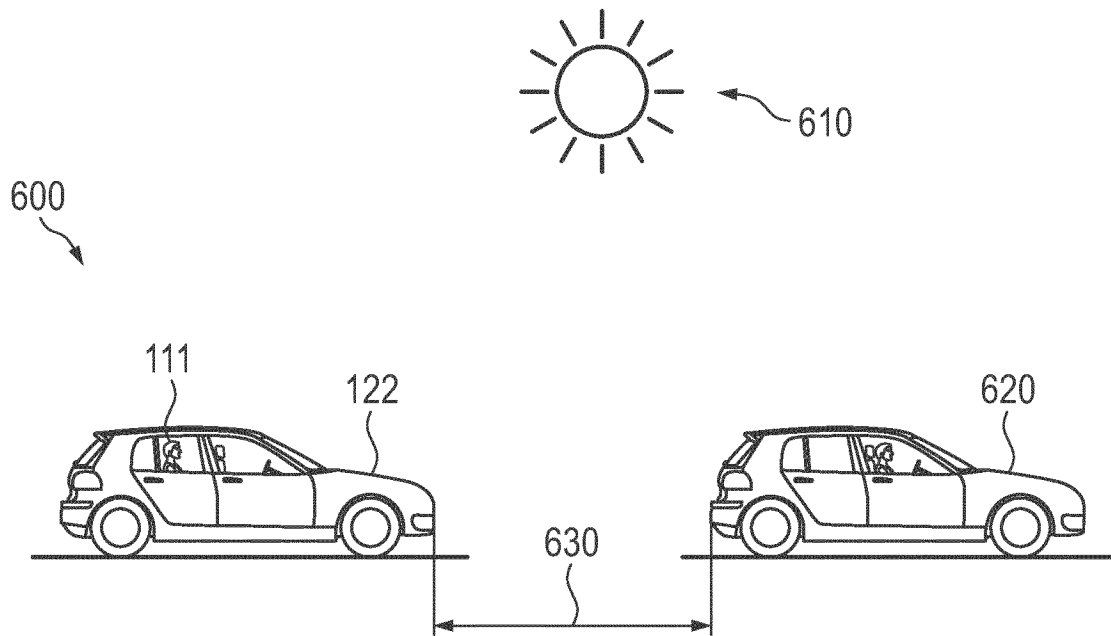


Fig. 6A

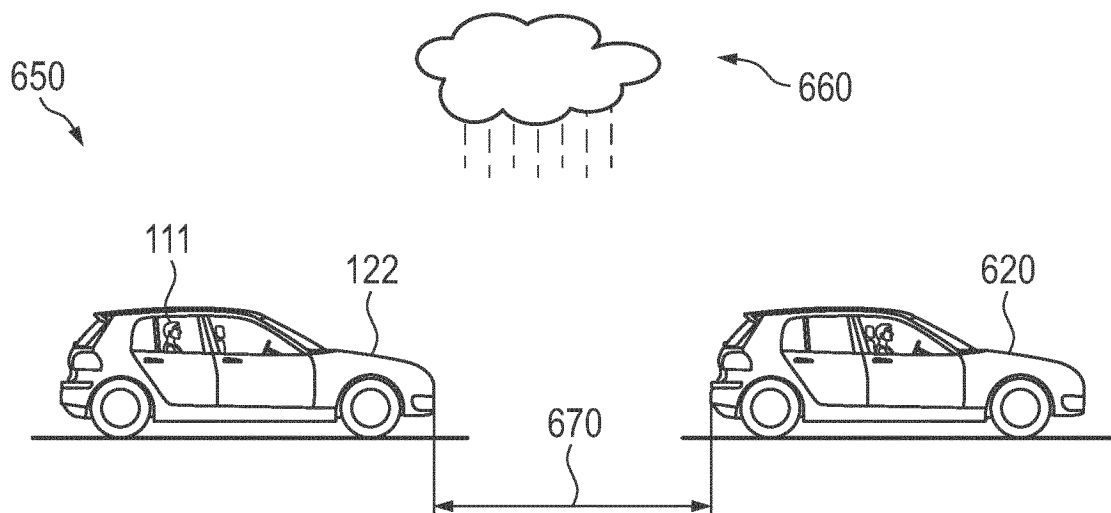
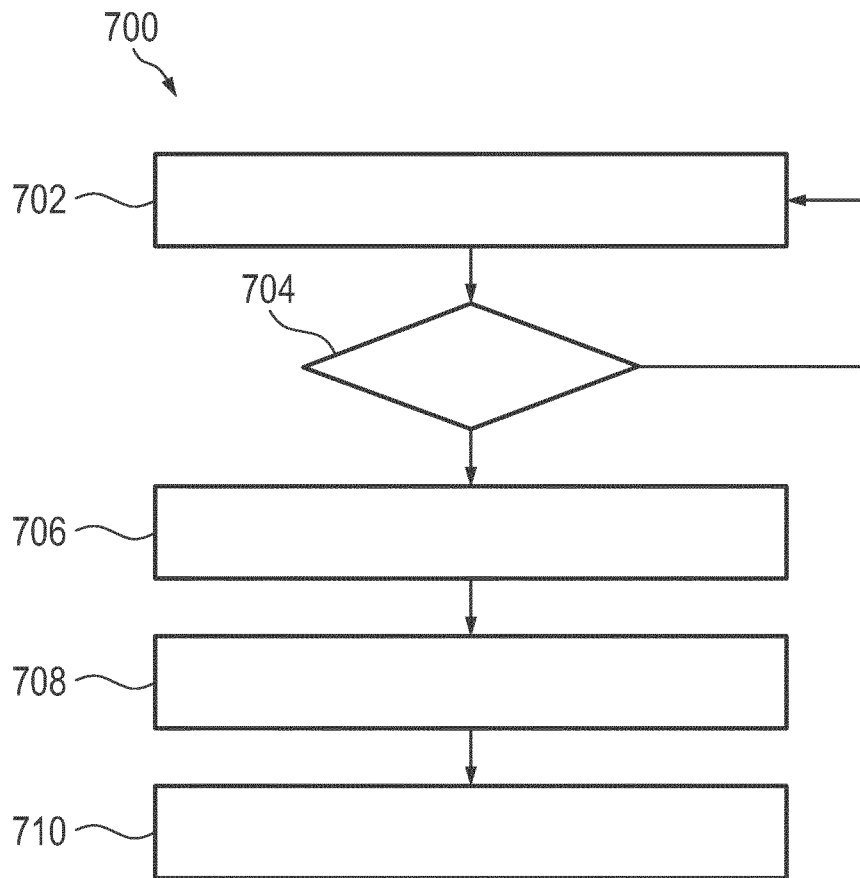
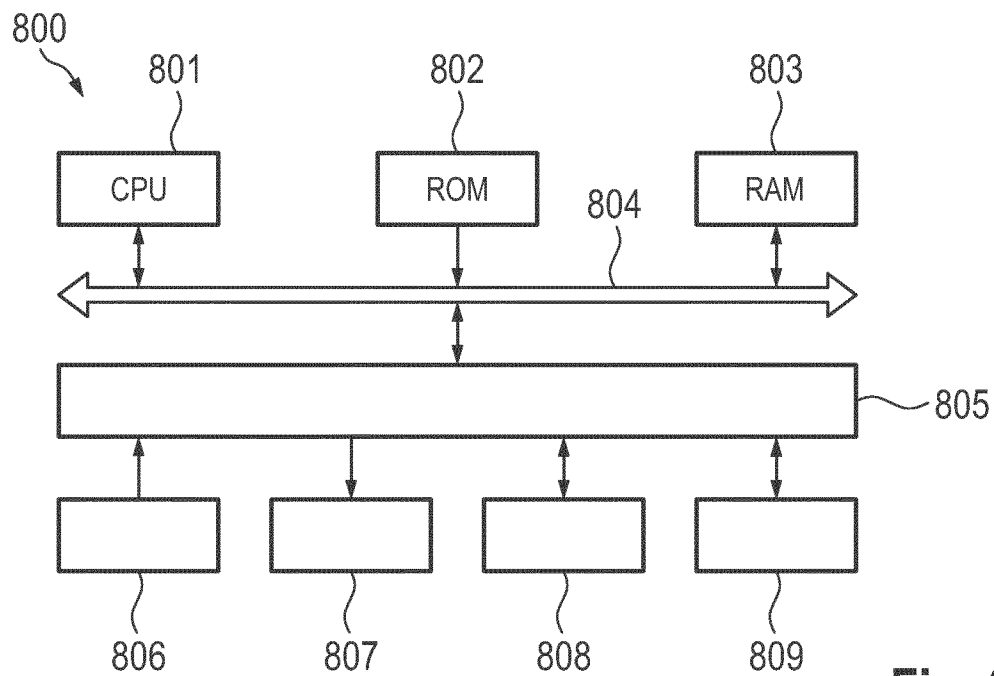


Fig. 6B

**Fig. 7****Fig. 8**

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2020/072751

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B60W50 B60W40/09
 ADD. B60W50/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 B60W

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2015/134417 A1 (INRIX INC [US]) 11 September 2015 (2015-09-11) paragraphs [0020], [0024], [0028] - [0031], [0035], [0042] - [0044], [0048] - [0049] figures 1,2,3,4 claims 1,2,3,4,5,17,18 -----	1-7, 10-18, 21-24
X	EP 3 415 392 A1 (HITACHI LTD [JP]) 19 December 2018 (2018-12-19) paragraphs [0023] - [0024], [0029] - [0030], [0038], [0040], [0053] figures 1,2,3,4,5 ----- -/-	1,2,4-6, 10,12, 13, 15-17, 21,23,24



Further documents are listed in the continuation of Box C.



See patent family annex.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

10 November 2020

Date of mailing of the international search report

20/11/2020

Name and mailing address of the ISA/

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