

(19)



(11)

EP 3 187 358 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
20.11.2019 Bulletin 2019/47

(51) Int Cl.:
B60K 28/06 ^(2006.01) **B60W 40/09** ^(2012.01)
A61B 5/00 ^(2006.01) **A61B 3/113** ^(2006.01)
A61B 5/0205 ^(2006.01) **A61B 5/024** ^(2006.01)
A61B 5/18 ^(2006.01)

(21) Application number: **16202346.9**

(22) Date of filing: **06.12.2016**

(54) ONBOARD SYSTEM FOR MITIGATING DISTRACTION RISK

BORDEIGENES SYSTEM ZUR MINDERUNG DES ABLENKUNGSRISIKOS

SYSTÈME EMBARQUÉ POUR ATTÉNUER LES RISQUES DE DISTRACTION

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **29.12.2015 US 201514981966**

(43) Date of publication of application:
05.07.2017 Bulletin 2017/27

(73) Proprietor: **Thunder Power New Energy Vehicle
Development Company Limited
Central, Hong Kong (CN)**

(72) Inventor: **LIAN, Po-Han
Taichung City (TW)**

(74) Representative: **Trinks, Ole
Meissner Bolte Patentanwälte
Rechtsanwälte Partnerschaft mbB
Postfach 10 26 05
86016 Augsburg (DE)**

(56) References cited:
**WO-A1-2016/115053 US-A1- 2013 245 886
US-A1- 2015 038 123**

EP 3 187 358 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

BACKGROUND

[0001] Driving while distracted can be hazardous, both for the driver of a vehicle, as well as for other drivers in the vicinity of that vehicle. Ideally, drivers should avoid distractions while driving. However, it is sometimes not possible to avoid every distraction that can catch a driver's attention. Accordingly, it may be advantageous to identify drivers that are distracted. However, not only is it difficult to identify distracted drivers, but even if distracted drivers could be identified, it is difficult to mitigate unsafe driving conditions caused by driver distraction.

[0002] US2013245886A1 discloses a method for a vehicle, wherein when it is determined that a driver is drowsy, a brake line in the vehicle is automatically pre-filled.

SUMMARY

[0003] The present disclosure solves these and other problems with the current technology. In particular, the disclosure provides a vehicle's onboard system capable of putting into place distraction settings upon determining that a driver is distracted. In particular, the onboard system includes a steering wheel that is fitted with one or more input sensors capable of detecting that a driver is distracted. Upon making a determination that the driver is distracted, the onboard system reduces the sensitivity of the vehicle throttle or increases the sensitivity of the vehicle braking system in order to increase the safety of the driving experience. In another example, a vehicle's ADAS system may be activated upon detecting that the driver is distracted. This may result in an electronic stability program (ESP) taking over control of the braking / steering functions in order to increase the safety of the driving experience.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] Various embodiments in accordance with the present disclosure will be described with reference to the drawings, in which:

FIG. 1A, FIG. 1B and FIG. 1C depict an onboard vehicle distraction detection system utilizing one or more input sensors in accordance with at least some embodiments;

FIG. 2 depicts system or architecture in which techniques for determining a distraction level of a driver of a vehicle and implementing distraction settings may be implemented in accordance with the disclosure;

FIG. 3 depicts an illustrative example of the onboard system in accordance with at least some embodiments;

FIG. 4A and FIG. 4B depict an illustrative use case involving a driver in accordance with at least some embodiments;

FIG. 5 depicts an illustrative flow chart demonstrating an example process that may be performed by the disclosed onboard system in accordance with at least some embodiments; and

FIG. 6 depicts an illustrative flow diagram depicting an example process for detecting driver distraction and implementing distraction settings in accordance with at least some embodiments.

DETAILED DESCRIPTION

[0005] Described herein is an onboard vehicle system comprising one or more input sensors capable of detecting input related to a driver, a processor device capable of interpreting the detected input, and one or more component adjusters configured to interact with components of the vehicle. Some embodiments may also include a communication means for communicating with a service provider computer (e. g., a wireless network antenna).

[0006] In embodiments, an onboard system includes a processor device that receives input from one or more input sensors. Upon receiving the input from the one or more input sensors, the onboard system utilizes it to determine whether the driver is currently distracted. If the driver is determined to be distracted, then the processor device takes one or more actions to make the driver's driving safer. In embodiments, the rules needed to determine whether a driver is distracted are specific to a particular driver. In these embodiments, the onboard system utilizes a distraction profile tailored to the particular driver.

[0007] Prior to discussing specific embodiments of the invention, some terms may be described in detail.

[0008] An "onboard system" may be any system housed within a vehicle. For example, an onboard system may include a number of input sensors, a processor device capable of processing data from the input sensors, a transmission means (e. g., a wireless platform), and any other suitable component. In some embodiments, the onboard system may be in communication with one or more component external to the onboard system.

[0009] A "component adjuster" may be any device configured to interact with a component of a vehicle. In some embodiments, a component adjuster may be an electronic switch configured to adjust the effectiveness of a vehicle component. For example, a component adjuster may be integrated into the master cylinder component of the vehicle's braking system. In this example, the component adjuster may be used to adjust the sensitivity of the braking system (e. g., by adjusting hydraulic pressure within the system). In some embodiments, a component adjuster may activate an advanced driver assistance system (ADAS). For example, the component adjuster may

activate lighting, activate adaptive cruise control, activate automatic braking, activate incorporated GPS/ traffic warnings, activate functionality to keep the driver in the correct lane, and/or activate a blind spot monitor. In some embodiments, multiple component adjusters may be utilized in a single onboard system. For example, a first component adjuster may increase brake sensitivity and a second component adjuster may decrease throttle sensitivity.

[0010] A "distraction profile" may be any set of indicators specific to a particular driver or vehicle that may be useful in determining whether the driver is distracted. For example, if a particular driver has a habit of texting while driving, then a distraction profile may include an indicator such that if the driver removes one hand from the steering wheel, the onboard system may determine that the driver is distracted. In another example, a distraction profile may include an indication that a particular driver's heartrate tends to be higher than average. This may prevent the onboard system from determining that the driver is distracted based on an elevated heart rate. In some embodiments, a distraction profile may be stored at a service provider computer and loaded into memory of the vehicle by the service provider. In some embodiments, the distraction profile may be created by a processor device of the onboard system within a vehicle based on one or more actions taken by the driver of the vehicle.

[0011] "Distraction settings" are any vehicle configuration settings, that, when applied to components within the vehicle, are intended to make driving of the vehicle safer for a distracted driver. For example, enabling distraction settings may result in an increased sensitivity of the vehicle braking system and/or a decreased sensitivity of the vehicle throttle system. In some embodiments, distraction settings may be unique to a particular driver. In some embodiments, a set of distraction settings may be provided to a vehicle by a service provider computer.

[0012] A "vehicle component" may be any device capable of executing at least one function of a vehicle. For example, a master cylinder is a vehicle component that executes a vehicle's braking function by applying hydraulic pressure to a brake disk. In some embodiments, the master cylinder may be signaled to execute the vehicle's brakes by a processor device. In some embodiments, the hydraulic pressure of the braking system may be increased at the master cylinder in order to increase the amount of braking force applied to the brake disk in response to an amount of movement of the brake pedal.

[0013] FIG. 1 depicts an onboard vehicle distraction detection system utilizing one or more input sensors in accordance with at least some embodiments. In FIG. 1, a steering wheel 102 is depicted as including multiple input sensors capable of detecting input related to a driver. In order to better illustrate some aspects of the described system, FIG. 1 is broken into FIG. 1A (a depiction of a steering wheel), FIG. 1B (a first cross-sectional view of the steering wheel), and FIG. 1C (a second cross-

sectional view of the steering wheel).

[0014] In some embodiments, the steering wheel may include input sensors capable of detecting a driver's biometric information. For example, the steering wheel may include a heart rate sensor 104 capable of detecting a driver's heart rate. The onboard system may be configured to determine, using information collected from the heart rate sensor 104, that a user is distracted. For example, the heart rate sensor may be utilized to identify a baseline heartrate for a particular driver. Upon detecting that the current heartrate is above the baseline heartrate, the onboard system may determine that the driver is stressed out, scared, or otherwise distracted. In another example, the input sensor may include a thermometer, sweat sensor, or any other input sensor capable of detecting a driver's biometric data. In some embodiments, the onboard system may include a camera device capable of capturing a driver's facial expressions. The driver's facial expressions may be interpreted using one or more image processing techniques and may be used to identify a state of mind for the driver. In some embodiments, the onboard system may include eye-tracking cameras capable of tracking a driver's eye movements. The onboard system may utilize these eye-tracking cameras to determine where a driver's attention is focused.

[0015] In some embodiments, the steering wheel may include one or more pressure sensors 106. These pressure sensors 106 may be configured to measure the amount of force being applied to the steering wheel. The onboard system may be configured to determine, using information collected from the one or more pressure sensors 106, that a user is distracted. For example, the onboard system may utilize one or more pressure sensor 106 to identify a baseline pressure for a particular user. Upon detecting an increase or decrease in pressure applied to the pressure sensors, the onboard system may determine that the driver is distracted (e. g., stressed out or focused on something other than driving). As depicted in FIG. 1C, a number of pressure sensors may be positioned so that pressure from various directions may be measured. For example, the pressure sensors 106 may be positioned along the exterior of the steering wheel in a radial fashion.

[0016] Although the one or more input sensors are depicted in FIG. 1 as being installed on the steering wheel, it should be noted that in some embodiments of the disclosure, the one or more input sensors may be located somewhere other than the steering wheel. Each of these embodiments is intended to be anticipated by the current disclosure. For example, the onboard system may include one or more sensors (e. g., accelerometers) capable of detecting sudden shifts in a vehicle's position. In this example, if the vehicle is determined to be moving from side to side (i. e., swerving), the onboard system may enable the distraction settings.

[0017] FIG. 2 depicts system or architecture in which techniques for determining a distraction level of a driver of a vehicle and implementing distraction settings may

be implemented in accordance with the disclosure. In some examples, a vehicle 202 may include a processor device 204. In some embodiments, the processor device 204 may be configured to communicate with a service provider computer 206 via a network 208, or via other network connections. The processor device 204 or the service provider computer 206 may be configured to process an input received from one or more input sensors and provide instructions for implementing one or more distraction settings.

[0018] The processor device 204 may be any type of computing device capable of performing the described functions. The processor device 204 may include one or more processors 210 capable of processing input from one or more input sensors 212. As is known in the art, there are a variety of input sensors 212 capable of detecting input related to a user or vehicle conditions, such as pressure sensors, heart rate sensors, accelerometers, cameras, microphones, etc. The input obtained by the input sensors may be from a variety of data input types, including, but not limited to, audio data, visual data, or biometric data. Programmatic code for an application or module utilized in the implementation of at least some embodiments may be stored and executed from the memory 214 of processor device 204. The processor device 204 may include a module for processing input information related to a vehicle driver (input processing module 216) and/or a module for assessing a level of stress of the driver based on the processed input information (distraction assessment module 218).

[0019] In some examples, the network(s) 208 may include any one or a combination of many different types of networks, such as cable networks, the Internet, wireless networks, cellular networks, and other private and/or public networks. It is also noted that the described techniques may apply in other client/server arrangements, as well as in non-client/server arrangements (e. g., locally stored applications, peer to-peer systems, etc.). In an exemplary embodiment, the processor device 304 may communicate with a network hub using one or more wireless communication networks (e. g., 3G, 4G, etc.). The network hub may, in turn, utilize a physical connection (e. g., copper cable, T1, Ethernet, etc.) to communicate with the service provider computer at a network address.

[0020] The service provider computer 206 may be any type of computing device such as, but not limited to, a mobile phone, a smart phone, a personal digital assistant (PDA), a laptop computer, a desktop computer, a server computer, a thin-client device, a tablet PC, etc. Additionally, it should be noted that, in some embodiments, the service provider computer 206 may be executed by one or more virtual machines implemented in a hosted computing environment. The hosted computing environment may include one or more rapidly provisioned and released computing resources, which computing resources may include computing, networking, and/or storage devices. A hosted computing environment may also be referred to as a cloud-computing environment.

[0021] In one illustrative configuration, the service provider computer 206 may include at least one memory 220 and one or more processing units (or processor(s)) 222. The processor(s) 222 may be implemented as appropriate in hardware, computer-executable instructions, firmware or combinations thereof. Computer-executable instruction or firmware implementations of the processor(s) 222 may include computer-executable or machine executable instructions written in any suitable programming language to perform the various functions described.

[0022] The memory 220 may store program instructions that are loadable and executable on the processor(s) 210 and/or processor(s) 222, as well as data generated during the execution of these programs. Depending on the configuration and type of service provider computer 206, the memory 220 may be volatile (such as random access memory (RAM)) and/or non-volatile (such as read-only memory (ROM), flash memory, etc.). The service provider computer 206 may also include additional storage 224, such as either removable storage or non-removable storage including, but not limited to, magnetic storage, optical disks, and/or tape storage. The disk drives and their associated computer-readable media may provide non-volatile storage of computer-readable instructions, data structures, program modules, and other data for the computing devices. In some implementations, the memory 220 may include multiple different types of memory, such as static random access memory (SRAM), dynamic random access memory (DRAM) or ROM. Turning to the contents of the memory 220 in more detail, the memory 220 may include an operating system 226 and one or more application programs or services for implementing the features disclosed herein including at least a module for processing input information related to a driver (input processing module 216) and/or a module for assessing a driver's distraction level based on the processed input (distraction assessment module 218). The memory 220 may also include distraction setting data 230, which provides data related to identifying portions of image information. In some embodiments, the distraction setting data 230 may be stored in a database.

[0023] The memory 220 and the additional storage 224, both removable and non-removable, are examples of computer-readable storage media. For example, computer-readable storage media may include volatile or non-volatile, removable or non-removable media implemented in any method or technology for storage of information such as computer-readable instructions, data structures, program modules or other data. As used herein, modules may refer to programming modules executed by computing systems (e. g., processors) that are part of the processor device 204 or the service provider computer 206. The service provider computer 206 may also contain communications connection(s) 232 that allow the service provider computer 206 to communicate with a stored database, another computing device or server, user terminals, and/or other devices on the network(s)

208. The service provider computer 206 may also include input/output (I/O) device(s) and/or ports 234, such as for enabling connection with a keyboard, a mouse, a pen, a voice input device, a touch input device, a display, speakers, a printer, etc.

[0024] Turning to the contents of the memory 220 in more detail, the memory 220 may include an operating system 226, a database containing distraction setting data 230 and the one or more application programs or services for implementing the features disclosed herein, including an input processing module 216 and/or a distraction assessment module 218.

[0025] In some embodiments, the input processing module 216 may be configured to receive input information from one or more input sensors, process the input information, and provide the processed information to the distraction assessment module 218. In some embodiments, the input processing module may collect multiple input information from multiple different input sensors. In some embodiments, the input processing module 216 may compare the received input information to a baseline. For example, the driver may be associated with a baseline heart rate. In this example, heartrate information received from a heartrate sensor may be compared to the baseline heartrate. In some embodiments, the baseline may be comprised of an average of recent input information. For example, the baseline heartrate may be comprised of an average heartrate taken over the last three minutes. In this example, if the driver experiences a sudden elevation in his or her heart rate, then the input processing module may indicate the increased heart rate to the distraction assessment module 218. However, in this example, if the driver has had an elevated heart rate for a long period of time, then the driver's baseline heartrate would eventually rise and the input processing module 216 may indicate that the driver's heartrate is at the baseline.

[0026] In some embodiments, the distraction assessment module 218 may be configured to receive processed input information from the input processing module 216 and determine whether the driver is stressed out or otherwise distracted. In some embodiments, the distraction assessment module 218 may be configured to determine that a driver is stressed out if he or she is gripping the steering wheel too tightly. This may be determined by analyzing input information received from pressure sensors located in the steering wheel. In some embodiments, the distraction assessment module 218 may receive an indication that pressure is no longer being applied to at least a portion of the steering wheel. This may be an indication that the driver has removed his or her hand from the steering wheel at this location. In this example, the distraction assessment module 218 may determine whether pressure on other portions of the steering wheel has increased, which may indicate that the driver is leaning. If pressure on other parts of the steering wheel has not increased, then the distraction assessment module 218 may determine that the driver is driving with

one hand. Alternatively, the distraction assessment module may determine that the driver is texting while driving. In some embodiments, the distraction assessment module may utilize a set of default rules. However, because this assessment may depend on the behavior habits of the particular driver, some embodiments may include the use of a personal distraction profile, as described below.

[0027] In some embodiments, the distraction setting data 230 at the service provider computer 206 may contain a distraction profile for one or more drivers. The distraction profile may include a list of indicators specific to that driver, as well as some default indicators. For example, the service provider computer 206 may provide a distraction profile that indicates Driver A has a habit of texting while driving. Additionally, the service provider computer 206 may provide a distraction profile that indicates Driver B never texts while driving. In applying the above scenario (in which the distraction assessment module 218 determined that the driver is driving with one hand) to each of the drivers, the distraction assessment module 218 may determine that Driver A is distracted while Driver B is not. In some embodiments, a driver's distraction profile may be provided to a vehicle on startup by a service provider computer 206. For example, upon identification of the driver, the service provider computer 206 may pre-load the driver's distraction profile into memory of the processor device 204. This allows a distraction assessment module 218 to be customized according to the driver. By way of illustrative example, consider a scenario in which a driver rents a vehicle from a vehicle rental agency. In this example, the driver may already have a distraction profile maintained by the rental agency. Once the rental agency creates a rental relationship between the driver and the rental vehicle, the driver's distraction profile may be uploaded to the rental vehicle.

[0028] Although described as being executed from the memory 220 of the service provider computer 206, the input processing module 216 and/or the distraction assessment module 218 may be located on, and executed from, the memory 214 of the processor device 204. In embodiments in which one or more of the modules are located on the service provider computer 206, the instructions for implementing one or more distraction settings may be transmitted to the vehicle and executed by the vehicle's onboard system.

[0029] FIG. 3 depicts an illustrative example of the onboard system in accordance with at least some embodiments. In FIG. 3, a processor device 302 is depicted as being communicatively coupled to a vehicle's steering wheel 304, braking system 306, throttle system 308, and an antenna 310. The onboard system may include one or more component adjusters attached to the vehicle's braking system and/or the vehicle's throttle system. In the depicted illustrative example, the antenna 310 is in communication with a service provider computer 312. It should be noted that not all embodiments of the onboard system will include an antenna 310 and/or a service provider computer 312.

[0030] In the illustrative example, the processor device 302 may receive an indication that the driver is gripping the steering wheel very tightly. This indication may be received from one or more pressure sensors located within the steering wheel 304. Upon receiving this indication, the processor device may determine that the user is stressed out or angry (and therefore distracted). In the depicted example, if the grip force applied to the steering wheel is above a threshold value, then the processor device 302 may send a signal to a component adjuster attached to the vehicle brake system 306 to increase the sensitivity of the brake pedal. For example, the processor device 302 may send a signal to a component adjuster attached to the master cylinder of the vehicle's braking system to cause an increase in the hydraulic pressure of the vehicle braking system 306. This may result in the vehicle's brake system becoming more sensitive, in that a movement of the vehicle's brake pedal will result in a greater braking force than the movement would typically result in.

[0031] Additionally, as depicted in the example, if the grip force applied to the steering wheel is above a threshold value, then the processor device 302 may send a signal to a component adjuster attached to the vehicle throttle system 308 to decrease the sensitivity of the vehicle's gas pedal. This may result in the vehicle's throttle system becoming less sensitive, in that a movement of the vehicle's gas pedal will result in a smaller acceleration than the movement would typically result in.

[0032] In some embodiments, the processor device 302 may receive a communication from the service provider computer 312 via the antenna 310. In some embodiments, the communication may include a distraction profile. In some embodiments, the service provider computer may perform one or more of the processes of the disclosed onboard system. For example, the service provider computer 312 may receive input related to the driver from one or more sensors of the onboard system, and may subsequently determine whether to activate a distraction setting. In this example, the service provider, upon determining that the driver is distracted, may transmit a signal to the processor device 302 to cause it to activate one or more distraction setting. As indicated above, not every embodiment of the disclosure will utilize an antenna 310 and/or a service provider computer 312.

[0033] Although the illustrative example in FIG. 3 discusses adjusting the sensitivity of a vehicle braking system 306 and/or a vehicle throttle system 308, it should be noted that a number of actions may be performed to increase the safety of a driving experience. For example, a vehicle's ADAS system may be activated upon detecting that the driver is distracted. This may result in an electronic stability program (ESP) taking over control of the braking / steering functions. It is intended that this disclosure encompass the activation of any suitable precautionary measure as a result of determining that a driver is distracted.

[0034] FIG. 4 depicts an illustrative use case involving

a driver in accordance with at least some embodiments. In FIG. 4, a driver is depicted in two separate positions along with a steering wheel 402. A first position for the driver is illustrated by FIG. 4A and a second position for the driver is illustrated by FIG. 4B. The first position illustrated in FIG. 4A represents an attentive or "normal" mode of vehicle operation for the driver. The second position illustrated in FIG. 4B represents a "distracted" mode of vehicle operation for the driver.

[0035] In FIG. 4A, a driver is depicted in a first position. In the depicted first position, the driver is attentive, having both hands on the steering wheel and looking forward. In this scenario, the onboard system may utilize pressure sensors located in the steering wheel 402 to determine that the both of the driver's hands are on the steering wheel 402 by detecting that grip force is being applied to the steering wheel 402 in at least two positions. Furthermore, the onboard system may determine that the grip force being applied to the steering wheel is below a threshold value and therefore indicates a normal level of stress. Under these conditions, the onboard system may determine that the driver is not stressed out nor distracted. The onboard system may implement regular driving settings under these conditions.

[0036] In FIG. 4B, the driver is depicted in a second position. In the depicted second position, the driver is distracted, having only one hand on the steering wheel and focused on something other than driving. The onboard system may utilize pressure sensors located in the steering wheel 402 to determine that only one of the driver's hands are on the steering wheel 402 by detecting that grip force is being applied to the steering wheel 402 in only one position. Additionally, the onboard system may determine that the driver is leaning or reaching upon detecting that the grip force applied by the one remaining hand is greater than it typically should be. Under these conditions, the onboard system may determine that the driver is distracted. The onboard system may subsequently implement one or more distraction settings under these conditions.

[0037] FIG. 5 depicts an illustrative flow chart demonstrating an example process that may be performed by the disclosed onboard system in accordance with at least some embodiments. The process 500 is illustrated as a logical flow diagram, each operation of which represents a sequence of operations that can be implemented in hardware, computer instructions, or a combination thereof. In the context of computer instructions, the operations represent computer-executable instructions stored on one or more computer-readable storage media that, when executed by one or more processors, perform the recited operations. Generally, computer-executable instructions include routines, programs, objects, components, data structures, and the like that perform particular functions or implement particular data types. The order in which the operations are described is not intended to be construed as a limitation, and any number of the described operations can be omitted or combined in any

order and/or in parallel to implement this process and any other processes described herein.

[0038] Some or all of the process 500 (or any other processes described herein, or variations and/or combinations thereof) may be performed under the control of one or more computer systems configured with executable instructions and may be implemented as code (e. g., executable instructions, one or more computer programs or one or more applications). In accordance with at least one embodiment, the process 500 of FIG. 5 may be performed by at least the one or more processor devices 204 shown in FIG. 2. The code may be stored on a computer-readable storage medium, for example, in the form of a computer program including a plurality of instructions executable by one or more processors. The computer-readable storage medium may be non-transitory.

[0039] Process 500 depicts a process loop in that, once the process 500 has been entered, the process 500 may continually repeat until the loop is exited. In some embodiments, this process loop may be entered into upon a vehicle engine being started or a vehicle transmission being put into gear. In some embodiments, this process loop may be exited upon detecting that the vehicle's engine has been shut off or that the vehicle's transmission has been taken out of gear. Process 502 may begin at 502, when an onboard system measures the amount of grip force being applied to a steering wheel. In some embodiments, this may be done using one or more pressure sensors attached to the steering wheel.

[0040] Once the grip force has been measured, the process may determine whether the grip force is above a threshold or baseline value. In some embodiments, the baseline value may be preprogrammed (e. g., corresponding to a value stored in the memory of the onboard system). In some embodiments, the onboard system may measure an increase in grip force being applied to the steering wheel. For example, the onboard system may determine an average grip force applied to the steering wheel within an interval of time. The onboard system may then use this average grip force as a threshold or baseline value. Although the process 500 is described with respect to grip force applied to a steering wheel, it should be noted that the onboard system may determine a driver's level of distraction using other means. For example, the onboard system may measure the driver's heart rate using a heart rate sensor. In this example, the driver's heartrate may be compared to a threshold value.

[0041] In some embodiments, if the measured grip force is normal (e. g., below the threshold value or within an acceptable range), then the onboard system may apply regular driving settings as depicted at 506. If the grip force is abnormal (e. g., above the threshold value or outside of an acceptable range), then the onboard system may determine that the driver may be prone to driving erratically. Under these circumstances, the onboard system may apply at least one distraction setting, as depicted at 508. Once the appropriate driving setting has been

applied, the process 500 may repeat, starting back at 502.

[0042] FIG. 6 depicts an illustrative flow diagram depicting an example process for detecting driver distraction and implementing distraction settings in accordance with at least some embodiments. In accordance with at least one embodiment, the process 600 of FIG. 6 may be performed by at least the one or more processor devices 204 shown in FIG. 2.

[0043] Process 600 of FIG. 6 may begin at 602, when a processor device receives input from one or more input sensors related to a driver of a vehicle in which the processor device is located. The input related to the driver may be analyzed to determine whether it is within acceptable bounds. In some embodiments, this may be done by determining whether the input received is within a threshold range stored at the processor device. It is envisioned that this threshold range may vary by driver. For example, in the case in which input is provided by pressure sensors on the steering wheel, one driver may use a different amount of grip force than another driver under normal driving conditions. Accordingly, in some embodiments, a distraction profile for a driver may include an indication of the amount of grip force typically used by that driver. The processor device may receive the distraction profile for a driver from the service provider computer prior to beginning process 600. In some embodiments, the threshold range may be calculated based on an average range of input over a time interval. For example, the processor device may measure the average grip force applied to the steering wheel over the last three minutes. The processor device may then apply a plus and minus value to identify an acceptable range of input.

[0044] Upon receiving input from the one or more input sensors, a processor device may determine, based on that received input, whether the driver is currently distracted at 604. In some embodiments, the processor device may determine that the received input is outside of the acceptable range of input values. In some embodiments, the processor device may determine that the driver is exhibiting a particular type of distraction based on received input. For example, the processor device may receive an indication that grip force has decreased on one side of the steering wheel and increased on the other side of the steering wheel. This may lead the processor device to determine that the driver is leaning to one side, or potentially reaching for something, and is therefore distracted.

[0045] Upon determining that a driver is currently distracted, the process 600 may cause a distraction setting to be activated at 606. The distraction settings may be applied based at least in part on what kind of driver distraction is detected. For example, if the driver is detected to be focusing on something other than driving, then the vehicle's ADAS system may be activated, resulting in an electronic stability program (ESP) taking over control of the braking / steering functions. In another example, if

the driver is detected to be texting while driving, then audio warnings may be activated to alert the driver as to driving conditions.

[0046] In some embodiments, the process may continue to receive input associated with the driver. In some cases, the factors that originally caused the process 600 to determine that the driver is distracted may dissipate. In some cases, additional input may be received that indicates the driver is no longer distracted at 610. Upon receiving an indication that the factors used to determine that the driver was distracted have dissipated, or upon receiving additional input that indicates the driver is no longer distracted, the process 600 may deactivate the distraction setting at 612. In some embodiments the process may activate a set of default (or regular) settings.

Claims

1. An onboard vehicle system, comprising:

- one or more input sensors (104, 106, 212);
- one or more component adjusters communicatively coupled to one or more vehicle components (306, 308);
- a processor device (204, 302) configured to:
 - receive input from the one or more input sensors (104, 106, 212), the input related to a condition of a driver;
 - determine, based at least in part on the received input, that the driver is distracted by comparing the received input to a stored driver profile data, the determination being made based on the received input diverging from the stored driver profile data; and
 - provide, to the component adjuster, an instruction to adjust an attribute of at least one of the one or more vehicle components; and

an antenna (310) configured to enable communication with a service provider computer (312), wherein the service provider computer (312) is configured to store the driver profile data, wherein the processor device (204, 302) is further configured to:

- transmit the received input to the service provider computer (312) via the antenna (310); and
- receive, from the service provider, an indication that the driver is distracted, and

wherein the instruction to adjust the one or more vehicle components (306, 308) includes at least one of a vehicle brake and vehicle throttle, wherein a brake force adjuster is caused to increase brake sensitivity of the braking system by increasing a hydraulic pressure of the braking system of the vehicle, and a throttle adjuster is caused to decrease

the gas pedal sensitivity so that a movement of the vehicle's gas pedal will result in a smaller acceleration than the movement would typically result in.

2. The onboard vehicle system of claim 1, wherein the one or more input sensors (104, 106, 212) is configured to capture input associated with an operator of the onboard vehicle system, wherein the one or more input sensors (104, 106, 212) includes at least one of a pressure sensor, a heartrate sensor, a thermometer, a sweat sensor, a camera device configured to capture facial expressions, and eye-tracking cameras configured to track eye movements.
3. The onboard vehicle system of one of the preceding claims, wherein the attribute of the at least one of the one or more vehicle components (306, 308) is a sensitivity to an activation signal.
4. The vehicle onboard system of one of the preceding claims, further comprising a memory (214) including instructions that, when executed with the processor device (204, 302), cause the system to, at least:
 - capture, via the one or more input sensors (104, 106, 212), input information related to a driver of a vehicle;
 - determine that the input information includes data values outside of an acceptable range;
 - determine, based on the determination that the input information includes data values outside of an acceptable range, that the driver is exhibiting distracted driving behavior;
 - implement at least one distraction setting, the distraction setting configured to at least partially mitigate the distracted driving behavior.
5. The vehicle onboard system of claim 4, wherein the acceptable range is specific to the driver, and/or wherein the acceptable range is provided to the processor device (204, 302) by a service provider computer (312), or wherein the acceptable range is calculated from an average input collected over a period of time.
6. The vehicle onboard system of claim 4 or 5, wherein the at least one distraction setting implemented is determined based on a type of distracted driving behavior, wherein implementing the at least one distraction setting includes implementing an advanced driver assistance system (ADAS).
7. A method comprising:

- receiving, from one or more input sensors (104, 106, 212), input related to a driver of a vehicle;
- transmitting via an antenna (310) the input to a service provider computer (312) and receiving from the service provider an indication that the driver is distracted;
- upon determining that the driver is likely distracted, causing at least one distraction setting to be activated, the activation of the at least one distraction setting resulting in a decreased likelihood of the vehicle being involved in an accident,

wherein the distraction setting includes adjusting one or more vehicle components (306, 308) including at least one of a vehicle brake and vehicle throttle, wherein a brake force adjuster is caused to increase brake sensitivity of the braking system by increasing a hydraulic pressure of the braking system of the vehicle, and a throttle adjuster is caused to decrease the gas pedal sensitivity so that a movement of the vehicle's gas pedal will result in a smaller acceleration than the movement would typically result in.

8. The method of claim 7, further comprising:

- receiving additional input related to the driver;
- determining, based at least in part on the additional input, that the driver is no longer distracted; and
- deactivating the at least one distraction setting.

9. The method of claim 7 or 8,

wherein the one or more input sensors (104, 106, 212) includes at least a heart rate sensor (104), or wherein the one or more input sensors (104, 106, 212) includes at least a pressure sensor (106) mounted on a steering wheel (102) of the vehicle.

10. The method of one of claims 7 to 9,

wherein the determination that the driver is distracted is made based on the input related to the driver exceeding a threshold value.

11. The method of one of claims 7 to 10,

further comprising identifying a distraction profile associated with the driver of the vehicle, wherein the determination that the driver is likely distracted is made based at least in part on the distraction profile.

12. The method of one of claims 7 to 11,

wherein causing the at least one distraction setting to be activated results in at least one of activating lighting, activating adaptive cruise control, activating automatic braking, activating incorporated GPS/traffic warnings, activating functionality to keep the driver in the correct lane, and/or activating a blind spot monitor.

Patentansprüche

1. Bordeigenes Fahrzeugsystem, aufweisend:

- einen oder mehrere Eingangssensoren (104, 106, 212);
- einen oder mehrere Komponenteneinsteller, die kommunikativ mit einer oder mehreren Fahrzeugkomponenten (306, 308) gekoppelt sind;
- eine Prozessorvorrichtung (204, 302), die ausgelegt ist zum:

- Empfangen von Input von dem einen oder mehreren Eingangssensoren (104, 106, 212), wobei sich der Input auf einen Zustand eines Fahrers bezieht;

- Bestimmen, zumindest teilweise basierend auf dem empfangenen Input, durch Vergleichen des empfangenen Inputs mit gespeicherten Fahrerprofildaten, dass der Fahrer abgelenkt ist, wobei die Bestimmung basierend auf dem empfangenen Input vorgenommen wird, der von den gespeicherten Fahrerprofildaten abweicht; und

- Bereitstellen einer Anweisung an den Komponenteneinsteller zum Einstellen eines Attributs von mindestens einer der einen oder mehreren Fahrzeugkomponenten; und

eine Antenne (310), die ausgelegt ist, eine Kommunikation mit einem Dienstleistercomputer (312) zu ermöglichen, wobei der Dienstleistercomputer (312) konfiguriert ist, um die Fahrerprofildaten zu speichern, wobei die Prozessorvorrichtung (204, 302) ferner ausgelegt ist zum:

- Senden des empfangenen Inputs an den Dienstleistercomputer (312) über die Antenne (310); und

- Empfangen eines Hinweises vom Dienstleister, dass der Fahrer abgelenkt ist, und

wobei die Anweisung zum Einstellen der einen oder mehreren Fahrzeugkomponenten (306, 308) mindestens eine einer Fahrzeugbremse und einer Fahrzeugdrossel beinhaltet,

wobei ein Bremskrafteinsteller veranlasst wird, die Bremsempfindlichkeit des Bremssystems durch Erhöhen eines Hydraulikdrucks des Bremssystems des Fahrzeugs zu erhöhen, und ein Drosselklappeneinsteller veranlasst wird, die Gaspedalempfindlichkeit zu verringern, so dass eine Bewegung des Gaspedals des Fahrzeugs zu einer geringeren Beschleunigung führt, als die Bewegung typischerweise bewirken würde.

2. Bordeigenes Fahrzeugsystem nach Anspruch 1, wobei der eine oder die mehreren Eingangssensoren (104, 106, 212) ausgelegt sind, Inputs zu erfassen, die einer Bedienungsperson des bordeigenen Fahrzeugsystems zugeordnet sind, wobei der eine oder die mehreren Eingangssensoren (104, 106, 212) mindestens einen eines Drucksensors, eines Herzfrequenzsensors, eines Thermometers, eines Schweißsensors, einer Kamervorrichtung, die zum Erfassen von Gesichtsausdrücken konfiguriert ist, und Eyetracking-Kameras, die zum Verfolgen von Augenbewegungen konfiguriert sind, beinhalten.
3. Bordeigenes Fahrzeugsystem nach einem der vorhergehenden Ansprüche, wobei das Attribut der mindestens einen der einen oder mehreren Fahrzeugkomponenten (306, 308) eine Empfindlichkeit gegenüber einem Aktivierungssignal ist.
4. Bordeigenes Fahrzeugsystem nach einem der vorhergehenden Ansprüche, ferner umfassend einen Speicher (214) mit Anweisungen, die, wenn sie mit der Prozessorvorrichtung (204, 302) ausgeführt werden, das System mindestens veranlassen zum:
- Erfassen von Inputinformationen, die sich auf einen Fahrer eines Fahrzeugs beziehen, über den einen oder die mehrere Eingangssensoren (104, 106, 212);
 - Bestimmen, dass die Inputinformationen Datenwerte außerhalb eines akzeptablen Bereichs enthalten;
 - Bestimmen, basierend auf der Bestimmung, dass die Inputinformationen Datenwerte außerhalb eines akzeptablen Bereichs beinhalten, dass der Fahrer ein abgelenktes Fahrverhalten aufweist;
 - Implementieren mindestens einer Ablenkungseinstellung, wobei die Ablenkungseinstellung ausgelegt ist, das abgelenkte Fahrverhalten zumindest teilweise zu mildern.
5. Bordeigenes Fahrzeugsystem nach Anspruch 4, wobei der akzeptable Bereich spezifisch für den Fahrer ist, und/oder wobei der akzeptable Bereich der Prozessorvorrichtung (204, 302) durch einen Dienstleistercomputer (312) bereitgestellt wird, oder wobei der akzeptable Bereich aus einem durchschnittlichen Input berechnet wird, der über einen Zeitraum gesammelt wird.
6. Bordeigenes Fahrzeugsystem nach Anspruch 4 oder 5, wobei die mindestens eine implementierte Ablenkungseinstellung basierend auf einer Art von abgelenktem Fahrverhalten bestimmt wird,
- wobei das Implementieren der mindestens einen Ablenkungseinstellung das Implementieren eines erweiterten Fahrerassistenzsystems (ADAS) beinhaltet.
7. Verfahren, aufweisend:
- Empfangen von Input, der sich auf einen Fahrer eines Fahrzeugs bezieht, von einem oder mehreren Eingangssensoren (104, 106, 212);
 - Übertragen des Inputs an einen Dienstleistercomputer (312) über eine Antenne (310) und Empfangen eines Hinweises vom Dienstleister, dass der Fahrer abgelenkt ist;
 - beim Bestimmen, dass der Fahrer wahrscheinlich abgelenkt ist, Veranlassen, dass mindestens eine Ablenkungseinstellung aktiviert wird, wobei die Aktivierung der mindestens einen Ablenkungseinstellung zu einer verminderten Wahrscheinlichkeit führt, dass das Fahrzeug in einen Unfall verwickelt wird,
- wobei die Ablenkungseinstellung das Einstellen einer oder mehrerer Fahrzeugkomponenten (306, 308) beinhaltet, die mindestens eine von einer Fahrzeugbremse und einer Fahrzeugdrossel beinhalten, wobei ein Bremskrafteinsteller veranlasst wird, die Bremsempfindlichkeit des Bremssystems durch Erhöhen eines Hydraulikdrucks des Bremssystems des Fahrzeugs zu erhöhen, und ein Drosselklappen-einsteller veranlasst wird, die Gaspedalempfindlichkeit zu verringern, so dass eine Bewegung des Gaspedals des Fahrzeugs zu einer geringeren Beschleunigung führt, als die Bewegung typischerweise bewirken würde.
8. Verfahren nach Anspruch 7, ferner aufweisend:
- Empfangen von zusätzlichem Input in Bezug auf den Fahrer;
 - Bestimmen, zumindest teilweise basierend auf dem zusätzlichen Input, dass der Fahrer nicht mehr abgelenkt ist; und
 - Deaktivieren der mindestens einen Ablenkungseinstellung.
9. Verfahren nach Anspruch 7 oder 8, wobei der eine oder die mehreren Eingangssensoren (104, 106, 212) mindestens einen Herzfrequenzsensor (104) beinhalten, oder wobei der eine oder die mehreren Eingangssensoren (104, 106, 212) mindestens einen Drucksensor (106) beinhalten, der an einem Lenkrad (102) des Fahrzeugs montiert ist.
10. Verfahren nach einem der Ansprüche 7 bis 9, wobei die Bestimmung, dass der Fahrer abgelenkt ist, basierend auf dem Input in Bezug auf den Fahrer

vorgenommen wird, der einen Schwellenwert überschreitet.

11. Verfahren nach einem der Ansprüche 7 bis 10, ferner aufweisend das Identifizieren eines dem Fahrer des Fahrzeugs zugeordneten Ablenkungsprofils, wobei die Bestimmung, dass der Fahrer wahrscheinlich abgelenkt ist, zumindest teilweise basierend auf dem Ablenkungsprofil vorgenommen wird.

5

12. Verfahren nach einem der Ansprüche 7 bis 11, wobei das Aktivieren der mindestens einen Ablenkungseinstellung zu mindestens einem Aktivieren der Beleuchtung, Aktivieren des Abstandsregeltempomats, Aktivieren der automatischen Bremsung, Aktivieren der eingebauten GPS/Verkehrswarnungen, Aktivieren der Funktionalität, um den Fahrer auf der richtigen Spur zu halten, und/oder Aktivieren einer Totwinkelüberwachung führt.

10

15

20

Revendications

1. Système embarqué à bord d'un véhicule, comprenant :

25

- un ou plusieurs capteurs d'entrée (104, 106, 212) ;
- un ou plusieurs dispositifs d'ajustement de composants couplés en termes de communication à un ou plusieurs composants du véhicule (306, 308) ;
- un dispositif processeur (204, 302) configuré pour :

30

35

- recevoir une entrée depuis lesdits un ou plusieurs capteurs d'entrée (104, 106, 212), l'entrée étant en relation avec une condition d'un conducteur ;
- déterminer, sur la base au moins en partie de l'entrée reçue, que le conducteur est distrait en comparant l'entrée reçue à des données de profil de conducteur mémorisées, la détermination étant faite sur la base de l'entrée reçue qui diverge des données de profil de conducteur mémorisées ; et
- fournir, au dispositif d'ajustement de composant, une instruction pour ajuster un attribut de l'un au moins desdits un ou plusieurs composants du véhicule ; et

40

45

50

- une antenne (310) configurée pour permettre une communication avec un ordinateur fournisseur de services (312), dans lequel l'ordinateur fournisseur de services (72) est configuré pour mémoriser les données de profil de conducteur, dans lequel le dispositif processeur (204, 302) est en outre configuré pour :

55

- transmettre l'entrée reçue à l'ordinateur fournisseur de services (312) via l'antenne (310) ; et
- recevoir, depuis le fournisseur de services, une indication que le conducteur est distrait, et

dans lequel l'instruction pour ajuster lesdits un ou plusieurs composants du véhicule (306, 308) inclut au moins un composant parmi un frein du véhicule et un papillon du véhicule, dans lequel un dispositif d'ajustement de force de freinage est amené à augmenter la sensibilité de freinage du système de freinage en augmentant une pression hydraulique du système de freinage du véhicule, et un dispositif d'ajustement de papillon est amené à diminuer la sensibilité de la pédale d'accélérateur de telle sorte qu'un mouvement de la pédale d'accélérateur du véhicule aura pour résultat une accélération plus faible que celle que le mouvement entraînerait typiquement comme résultat.

2. Système embarqué à bord d'un véhicule selon la revendication 1,

dans lequel lesdits un ou plusieurs capteurs d'entrée (104, 106, 212) est configuré pour capturer une entrée associée à un opérateur du système embarqué à bord d'un véhicule, dans lequel lesdits un ou plusieurs capteurs d'entrée (104, 106, 212) incluent au moins un capteur parmi un capteur de pression, un capteur de rythme cardiaque, un thermomètre, un capteur de transpiration, un dispositif à caméra configuré pour capturer des expressions faciales, et des caméras de suivi oculaire configurées pour suivre les mouvements des yeux.

3. Système embarqué à bord d'un véhicule selon l'une des revendications précédentes, dans laquelle l'attribut dudit au moins un des composants du véhicule (306, 308) est une sensibilité à un signal d'activation.

4. Système embarqué à bord d'un véhicule selon l'une des revendications précédentes, comprenant en outre une mémoire (214) incluant des instructions qui, lorsqu'elles sont exécutées avec le dispositif processeur (204, 302), amènent le système, au moins :

- à capturer, via lesdits un ou plusieurs capteurs d'entrée (104, 106, 212), des informations d'entrée en relation à un conducteur du véhicule ;
- à déterminer que les informations d'entrée incluent des valeurs de données à l'extérieur d'une plage acceptable ;
- à déterminer, sur la base de la détermination que les informations d'entrée incluent des valeurs de données à l'extérieur d'une plage ac-

- ceptable, que le conducteur présente un comportement de conduite distrait ;
 - à mettre en œuvre au moins un réglage de distraction, le réglage de distraction étant configuré pour remédier au moins partiellement au comportement de conduite distrait.
5. Système embarqué à bord d'un véhicule selon la revendication 4, dans lequel la plage acceptable est spécifique au conducteur, et/ou dans lequel la plage acceptable est fournie au dispositif processeur (204, 302) par un ordinateur fournisseur de services (312), ou dans lequel la plage acceptable est calculée à partir d'une entrée moyenne recueillie sur une période temporelle.
6. Système embarqué à bord d'un véhicule selon la revendication 4 ou 5, dans lequel ledit au moins un réglage de distraction mis en œuvre est déterminé sur la base d'un type de comportement de conduite distrait, dans lequel la mise en œuvre un dudit au moins un réglage de distraction inclut la mise en œuvre d'un système d'assistance avancée au conducteur (ADAS).
7. Procédé, comprenant les étapes consistant à :
- recevoir, depuis un ou plusieurs capteurs d'entrée (104, 106, 212), une entrée en relation à un conducteur d'un véhicule ;
 - transmettre, via une antenne (310), l'entrée à un ordinateur fournisseur de services (312) et recevoir depuis le fournisseur de services une indication que le conducteur est distrait ;
 - lors d'une détermination que le conducteur est vraisemblablement distrait, entraîner l'activation d'au moins un réglage de distraction, l'activation dudit au moins un réglage de distraction ayant pour résultat une réduction de la probabilité que le véhicule soit impliqué dans un accident,
- dans lequel le réglage de distraction inclut l'ajustement d'un ou plusieurs composants (306, 308) du véhicule, incluant au moins un composant parmi un frein du véhicule et un papillon du véhicule, dans lequel un dispositif d'ajustement de force de freinage est amené à augmenter la sensibilité de freinage du système de freinage en augmentant une pression hydraulique du système de freinage du véhicule, et un dispositif d'ajustement de papillon est amené à diminuer la sensibilité de la pédale d'accélérateur de telle sorte qu'un mouvement de la pédale d'accélérateur du véhicule aura pour résultat une accélération plus faible que celle que le mouvement entraînerait typiquement comme résultat.
8. Procédé selon la revendication 7, comprenant en outre les étapes consistant à :
- recevoir une entrée additionnelle en relation au conducteur ;
 - déterminer, sur la base au moins en partie de l'entrée additionnelle, que le conducteur n'est plus distrait ; et
 - désactiver ledit au moins un réglage de distraction.
9. Procédé selon la revendication 7 ou 8, dans lequel lesdits un ou plusieurs capteurs d'entrée (104, 106, 212) incluent au moins un capteur de rythme cardiaque (104), ou dans lequel lesdits un ou plusieurs capteurs d'entrée (104, 106, 212) incluent au moins un capteur de pression (104) monté sur un volant de direction (102) du véhicule.
10. Procédé selon l'une des revendications 7 à 9, dans lequel la détermination que le conducteur est distrait est effectuée sur la base de l'entrée en relation au conducteur en excès d'une valeur seuil.
11. Procédé selon l'une des revendications 7 à 10, comprenant en outre l'identification d'un profil de distraction associé au conducteur du véhicule, dans lequel la détermination que le conducteur est vraisemblablement distrait est effectuée au moins en partie sur la base du profil de distraction.
12. Procédé selon l'une des revendications 7 à 11, dans lequel l'activation dudit au moins un réglage de distraction a pour résultat l'une au moins des activations suivantes : activation de l'éclairage, activation du régulateur de vitesse adaptatif, activation du freinage automatique, activation des avertissements du système GPS incorporé/des avertissements de trafic, activation d'une fonctionnalité pour maintenir le conducteur dans la voie correcte, et/ou activation d'un dispositif de surveillance de zone de non-visibilité.

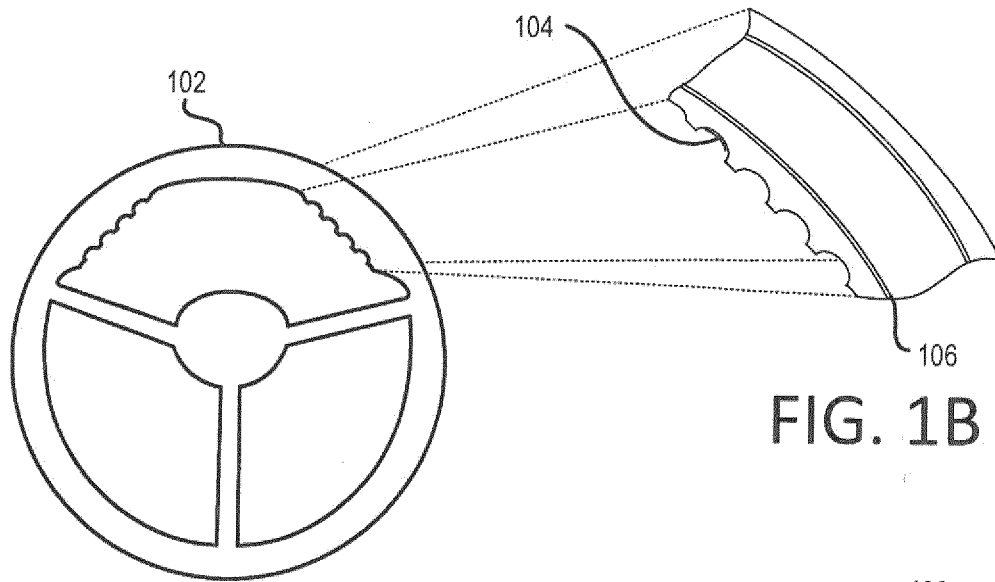


FIG. 1A

FIG. 1B

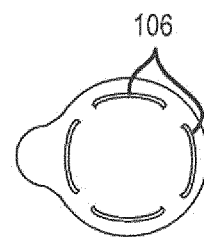


FIG. 1C

FIG. 1

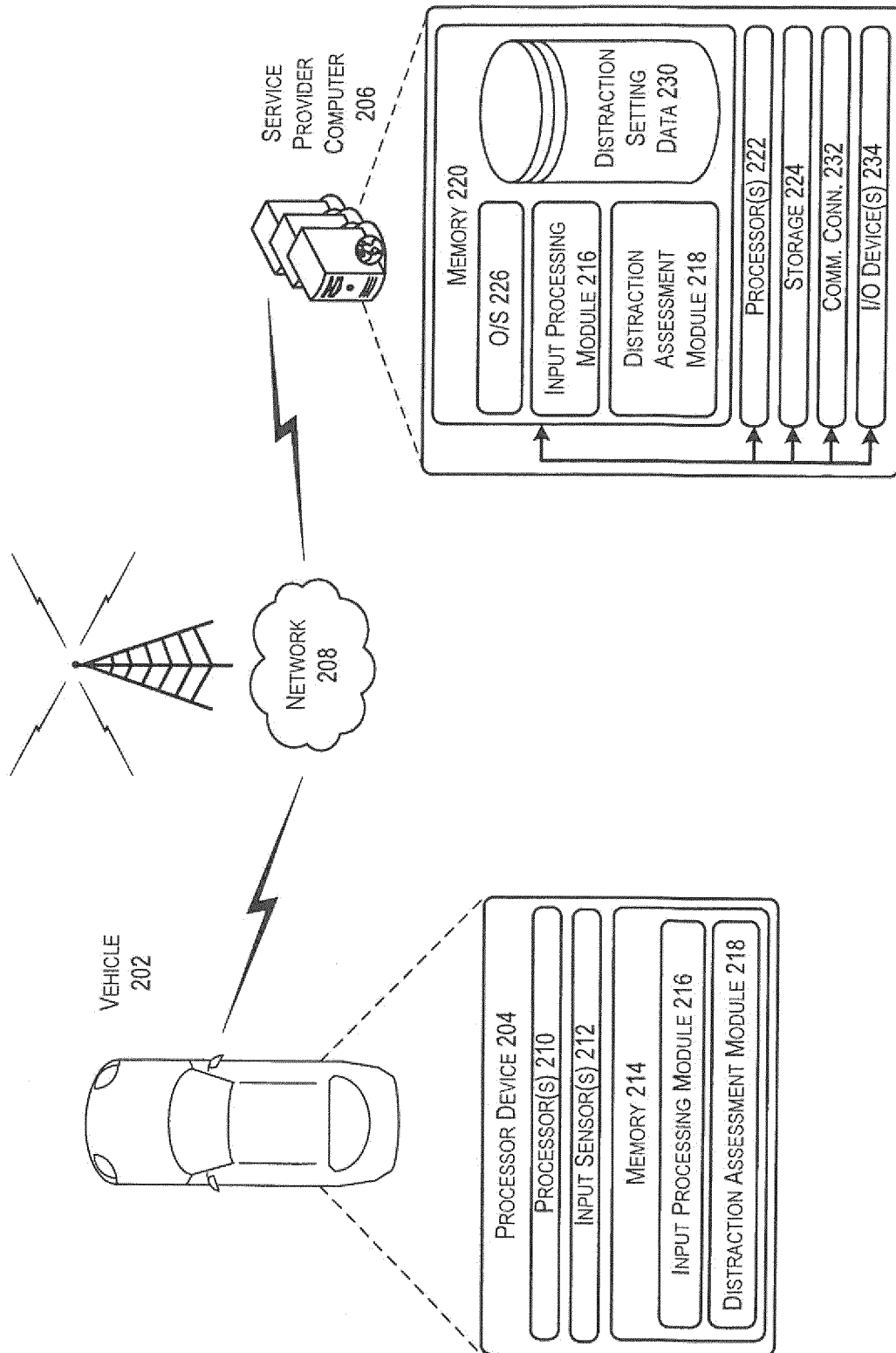


FIG. 2

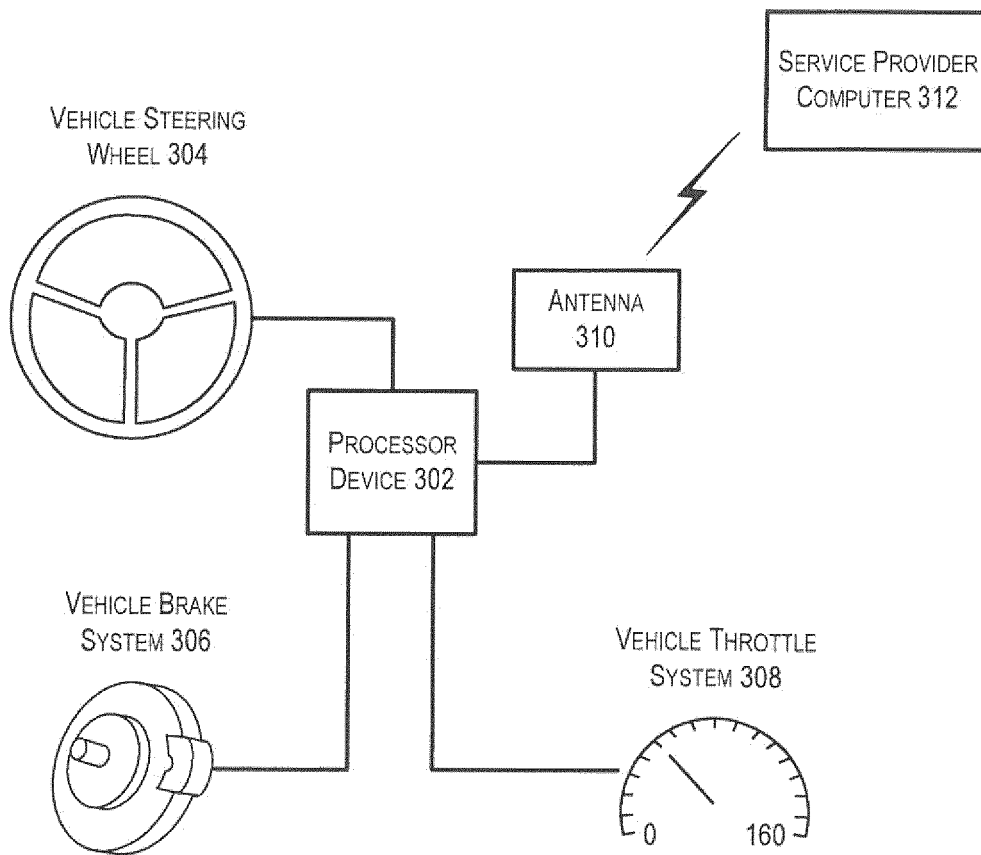


FIG. 3

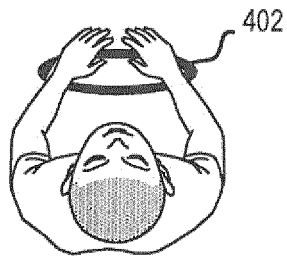


FIG. 4A

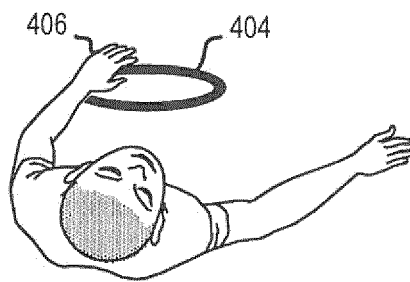


FIG. 4B

FIG. 4

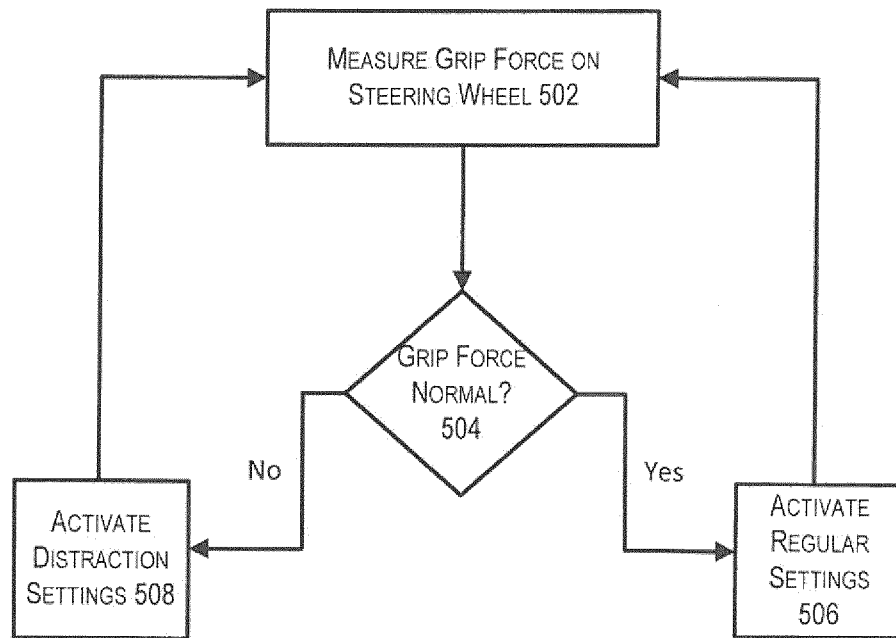
500

FIG. 5

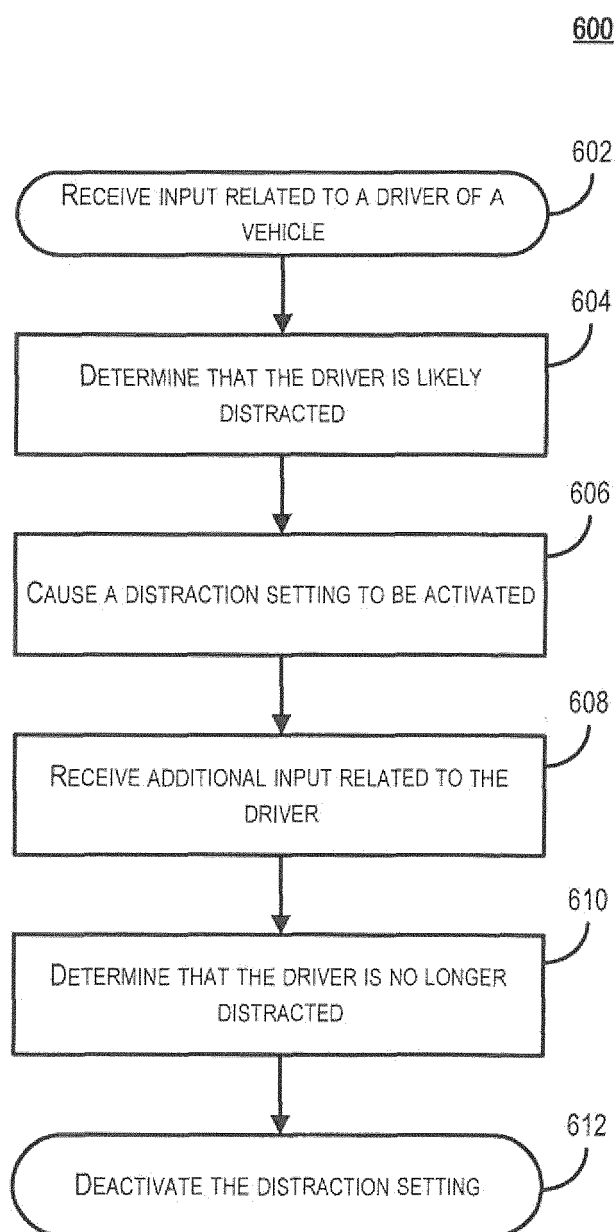


FIG. 6

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 2013245886 A1 [0002]

专利名称(译)	车载系统以降低偏转风险		
公开(公告)号	EP3187358B1	公开(公告)日	2019-11-20
申请号	EP2016202346	申请日	2016-12-06
[标]发明人	LIAN PO HAN		
发明人	LIAN, PO-HAN		
IPC分类号	B60K28/06 B60W40/09 A61B5/00 A61B3/113 A61B5/0205 A61B5/024 A61B5/18		
CPC分类号	B60W40/08 B60W50/14 B60W2040/0818 B60W2050/143 B60K28/06 B60K2370/55 B60K2370/569 B60K2370/573 B60K2370/586 B60K2370/589 B60K2370/5899 B60K2370/592 B60K2370/73 B60K2370/736 B60W10/06 B60W10/184 B60W50/12 B60W2050/0095 B60W2540/22 B60W2540/221 B60W2540/26 A61B3/113 A61B5/0077 A61B5/0205 A61B5/024 A61B5/18 A61B5/7282 B60W40/09		
代理机构(译)	TRINKS , OLE		
优先权	14/981966 2015-12-29 US		
其他公开文献	EP3187358A3 EP3187358A2		
外部链接	Espacenet		

摘要(译)

在此描述的是一种车载系统，其能够确定车辆的驾驶员分心并且实现一个或多个分心设置以减轻不安全的驾驶条件。在一些实施例中，车载系统包括：一个或多个输入传感器，被配置为收集与驾驶员有关的输入；一个或多个部件调整器，被配置为调整车辆部件的属性；以及处理器设备，被配置为从一个或多个接收输入。输入传感器，确定驾驶员是否分心，然后激活一个或多个组件调节器。在一些实施例中，车载系统可以与服务提供商计算机通信，该服务提供商计算机被配置为维护驾驶员的用户帐户以及驾驶员的注意力分散状况。

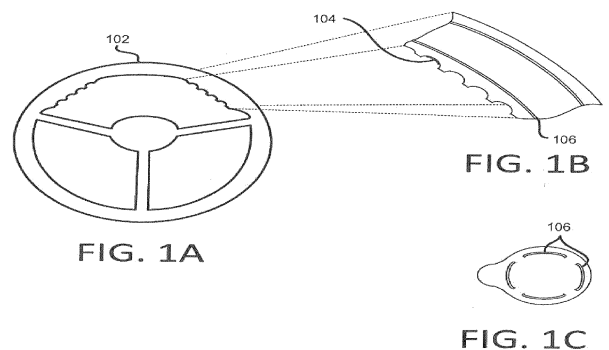


FIG. 1