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Olson et al.

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(54) **DISTRACTED DRIVER PREVENTION SYSTEMS AND METHODS**

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(51) **Int. Cl.**

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B60W 40/08	(2012.01)
B60K 35/00	(2006.01)

(52) **U.S. Cl.**

CPC ***B60W 40/08*** (2013.01); ***B60K 35/00*** (2013.01)

(58) **Field of Classification Search**

CPC B60W 40/09; B60K 35/00
USPC 340/576
See application file for complete search history.

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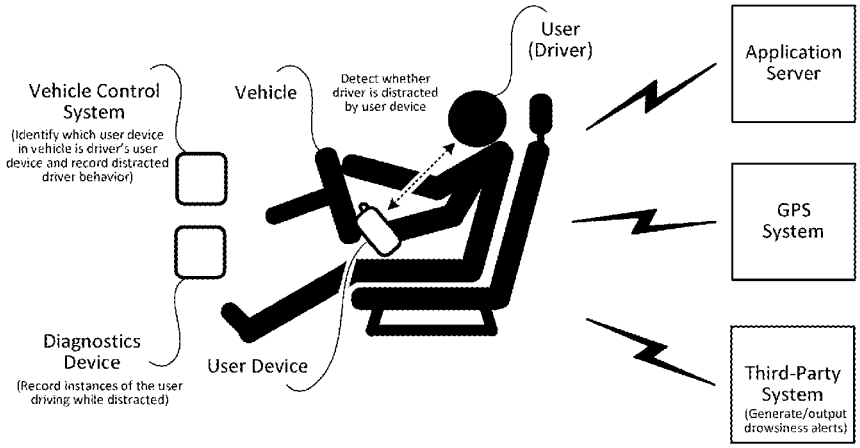
Assistant Examiner — Royit Yu

(57) **ABSTRACT**

A user device may be used to prevent a user from driving a vehicle while distracted by the user device. The user device may create a user profile, determine whether the user is driving, and collect usage data while the user is driving. The user profile may include information regarding the driver's propensity to be distracted while driving and the usage data may include information on whether the user is actually distracted by the user device. The user device may determine whether the driver is distracted based on the user profile and the usage data, and may respond in one or more ways, such as by alerting the driver with an audio signal, disabling a feature of the user device, logging instances of user distraction with a diagnostics device, activating a braking system of the vehicle, warning nearby drivers about the driver being distracted, and more.

20 Claims, 15 Drawing Sheets



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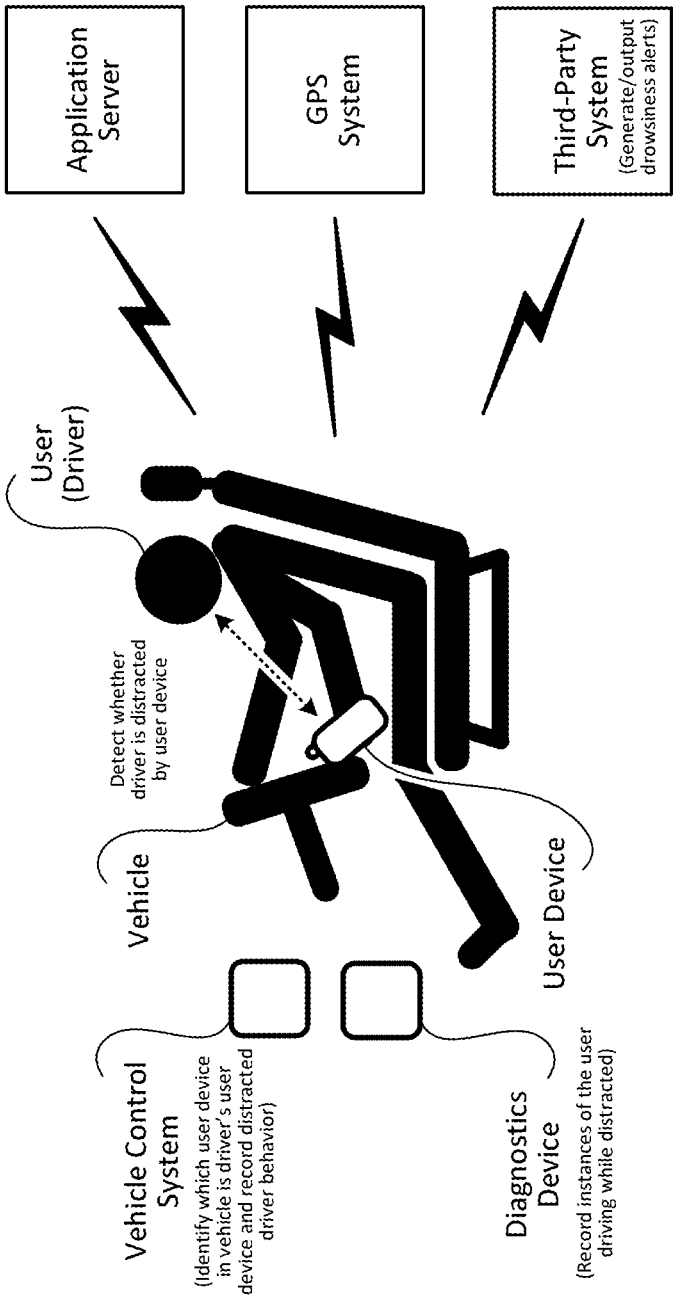
Application Server
GPS System
Third-Party System
(Generate/output drowsiness alerts)
User (Driver)
Detect whether driver is distracted by user device
Vehicle
User Device
Vehicle Control System
(Identify which user device in vehicle is driver's user device and record distracted driver behavior)
Diagnostics Device
(Record instances of the user driving while distracted)

Fig. 1

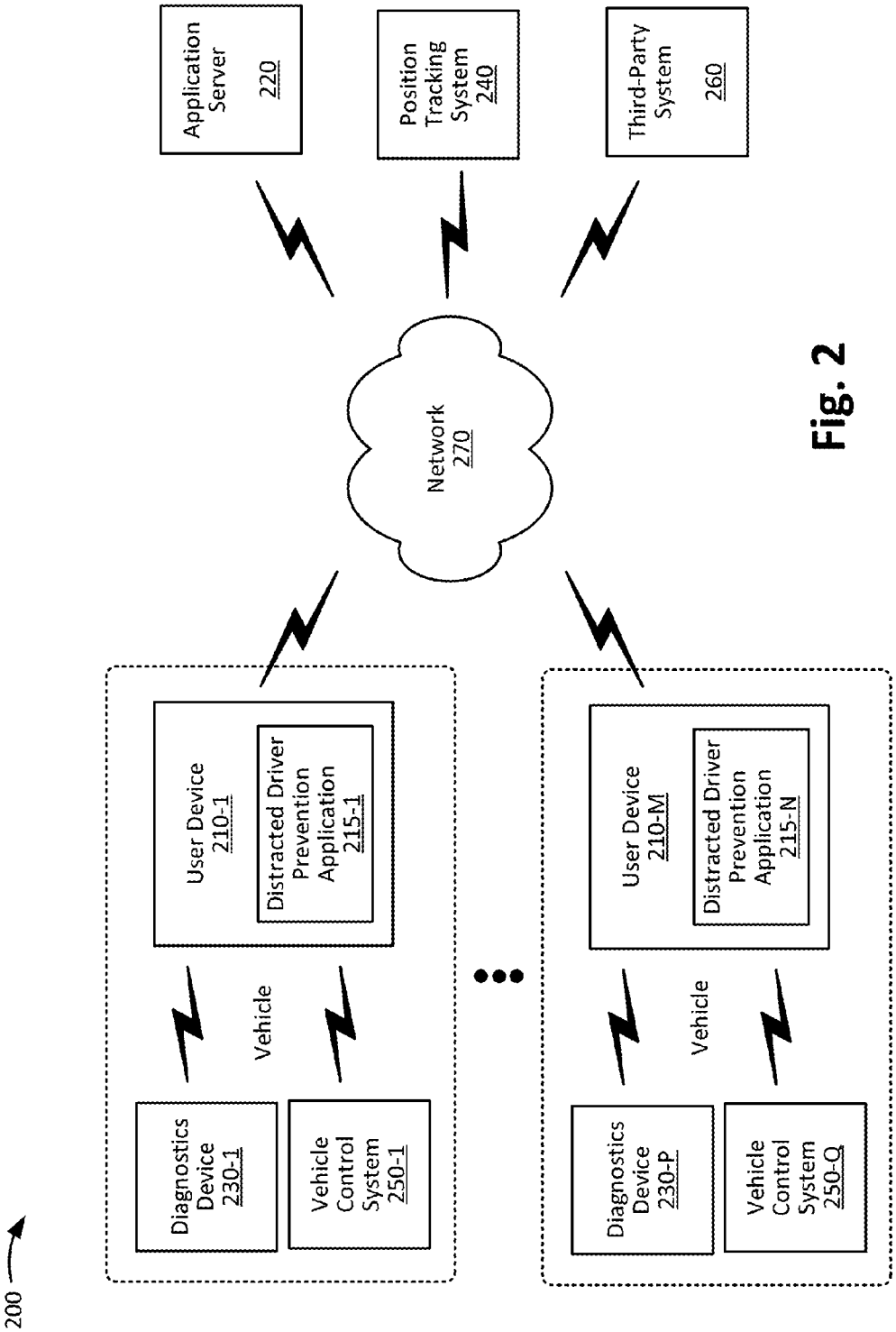
200
Application Server 220
Position Tracking System 240
Third-Party System 260
Network 270
User Device 210-1
Distracted Driver Prevention Application 215-1
Diagnostics Device 230-1
Vehicle
Vehicle Control System 250-1
User Device 210-M
Distracted Driver Prevention Application 215-N
Diagnostics Device 230-P
Vehicle
Vehicle Control System 250-Q

Fig. 2

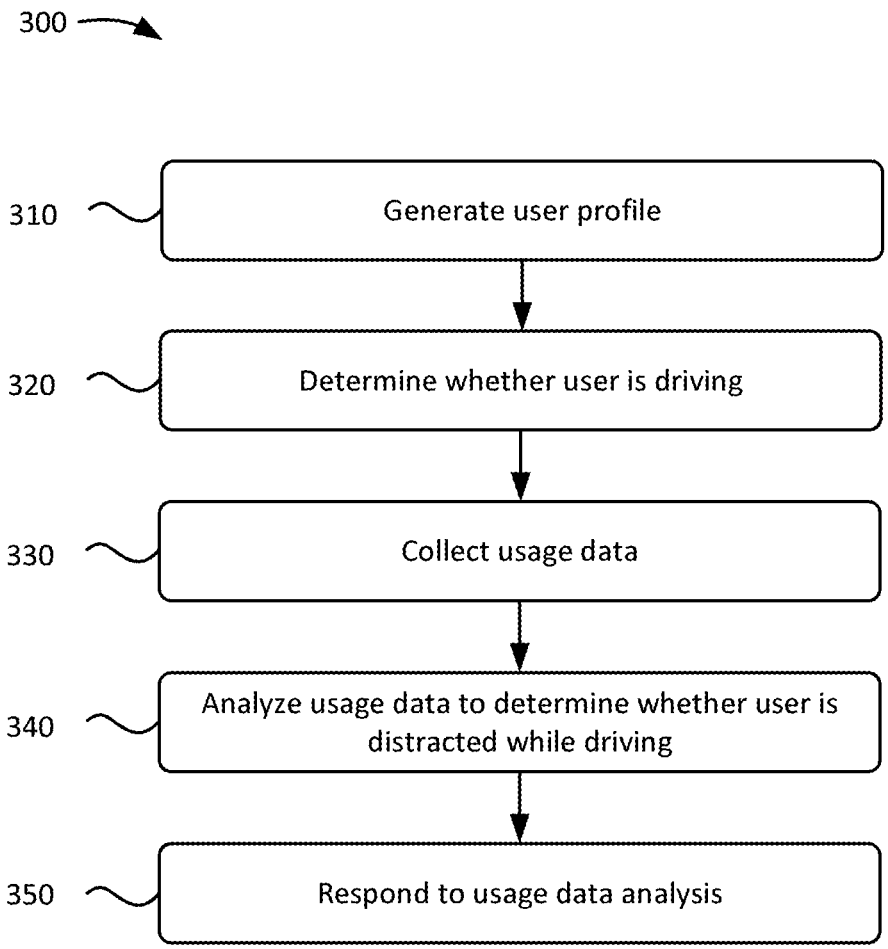
300
310
Generate user profile
320
Determine whether user is driving
330
Collect usage data
340
Analyze usage data to determine whether user is distracted while driving
350
Respond to usage data analysis

Fig. 3

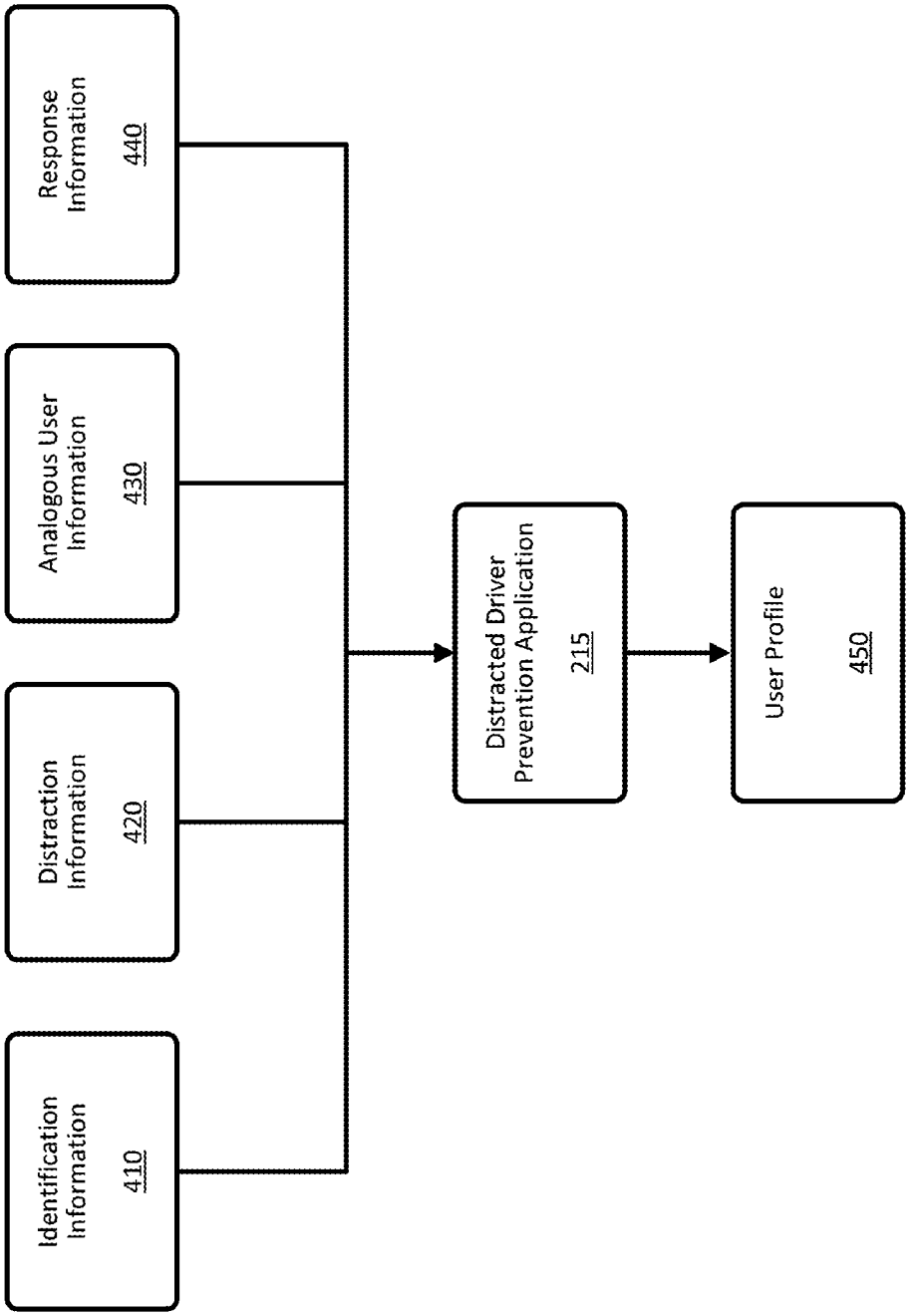
Identification Information 410
Distraction Information 420
Analogous User Information 430
Response Information 440
Distracted Driver Prevention Application 215
User Profile 450

Fig. 4

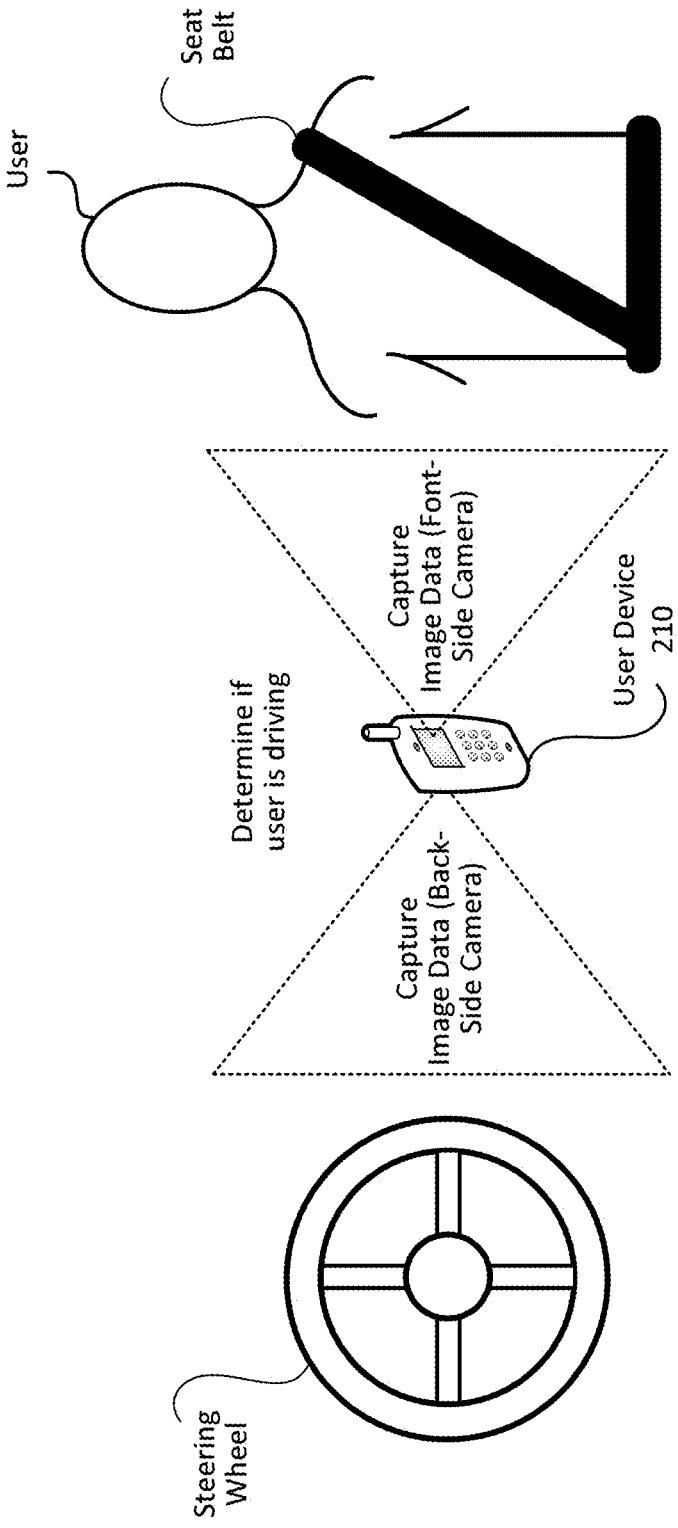
User
Seat Belt
Determine if user is driving
Capture Image Data (Front-Side Camera)
Capture Image Data (Back-Side Camera)
User Device 210
Steering Wheel

Fig. 5

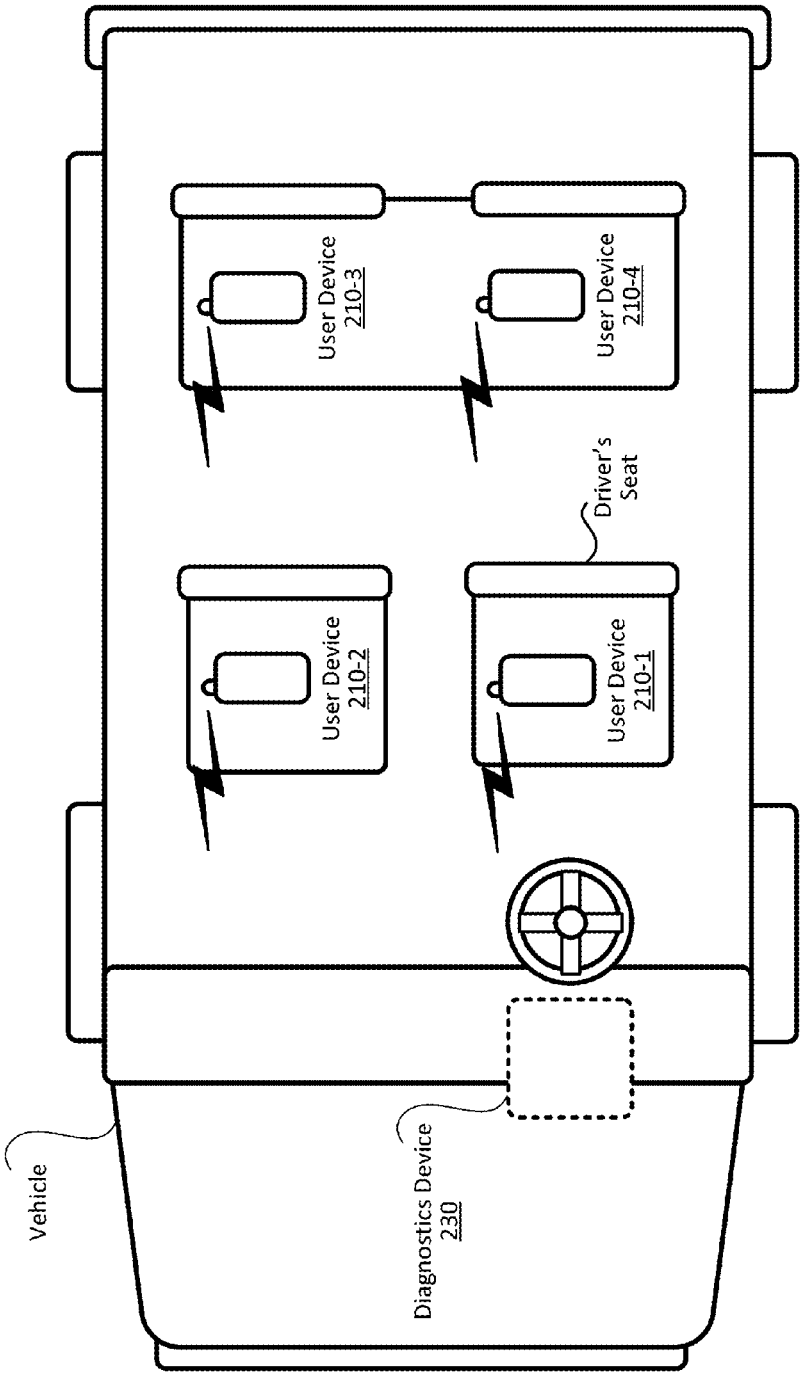
Vehicle
Diagnostics Device
230
User Device
210-2
User Device
210-3
Driver's
Seat
User Device
210-1
User Device
210-4

Fig. 6

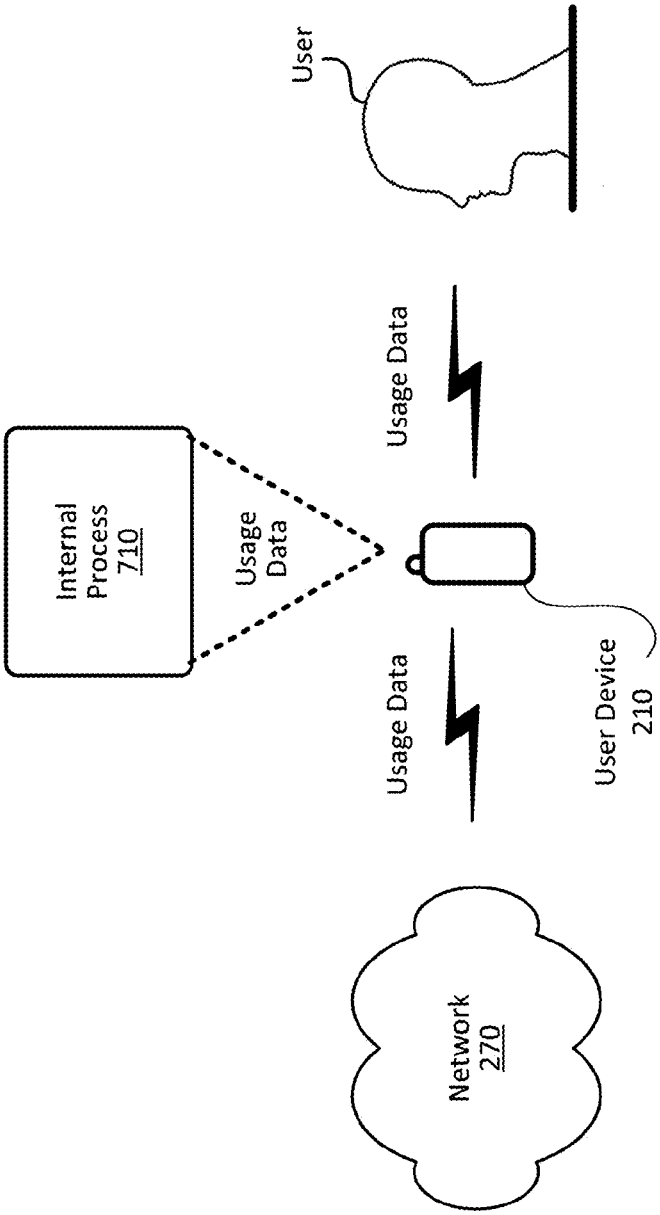
Internal Process 710
Usage Data
Usage Data
User
Usage Data
User Device 210
Network 270

Fig. 7

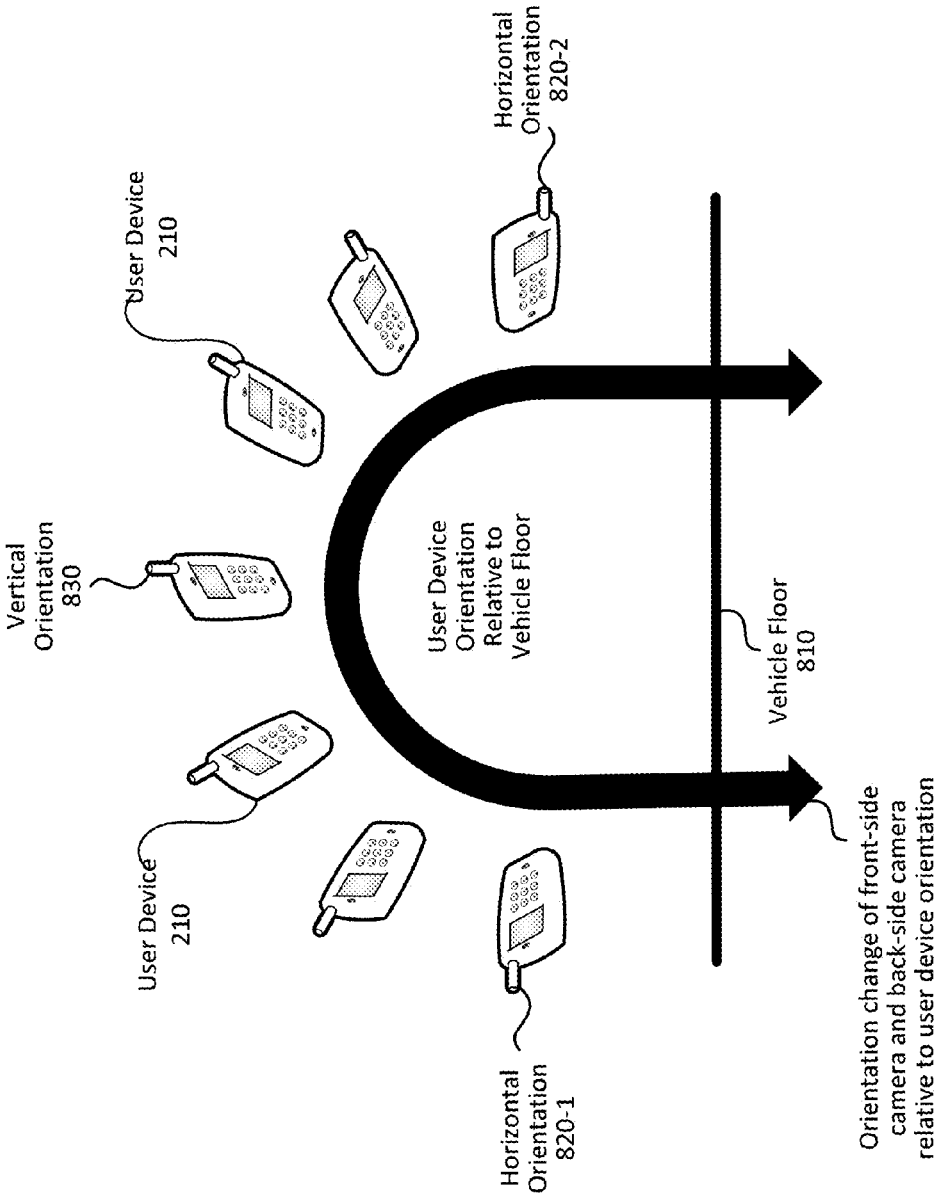
Vertical Orientation 830
User Device 210
User Device 210
Horizontal Orientation 820-1
User Device Orientation Relative to Vehicle Floor
Horizontal Orientation 820-2
Vehicle Floor 810
Orientation change of front-side camera and back-side camera relative to user device orientation

Fig. 8

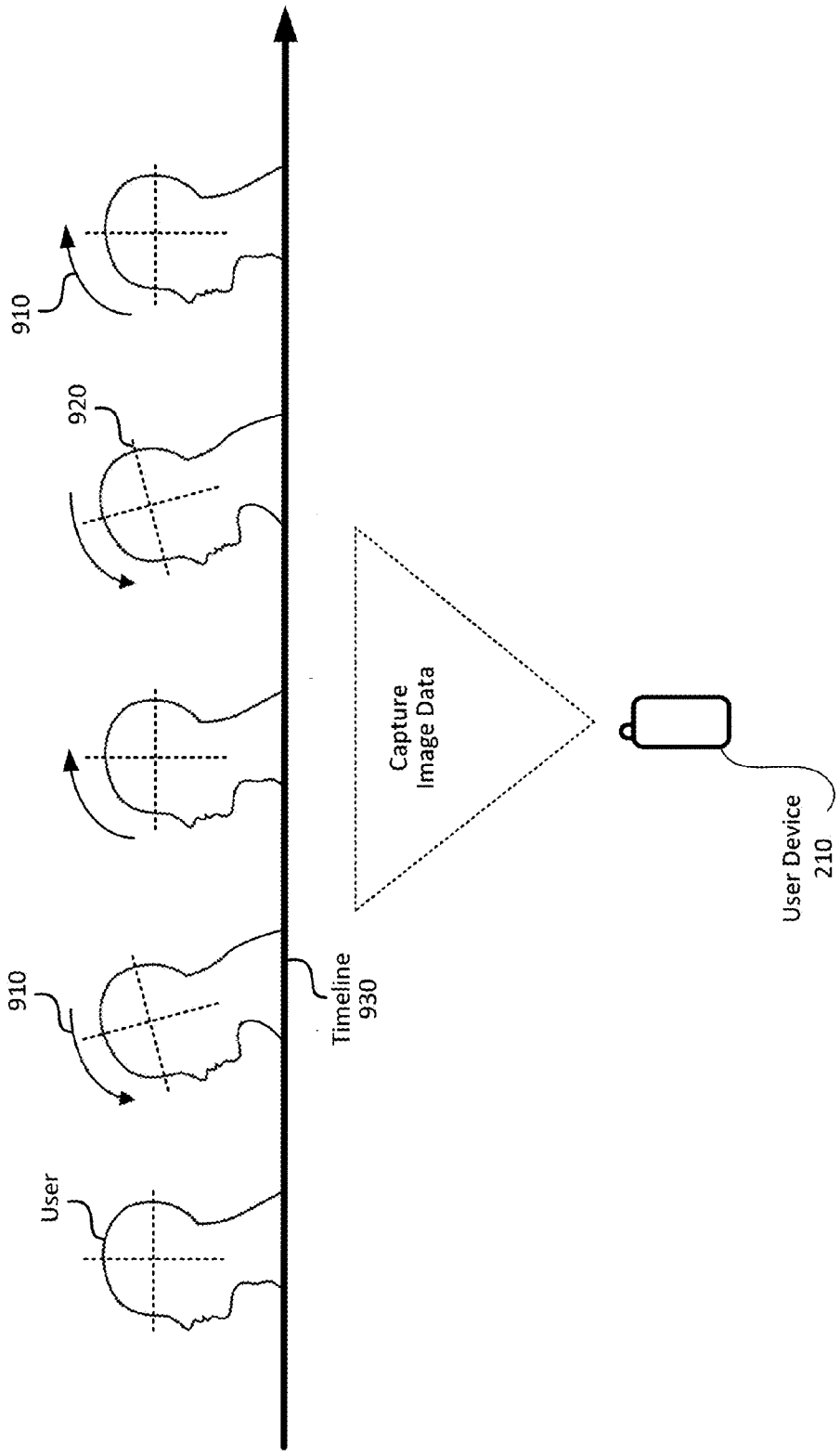
910
920
910
User
Timeline
930
Capture
Image Data
User Device
210

Fig. 9

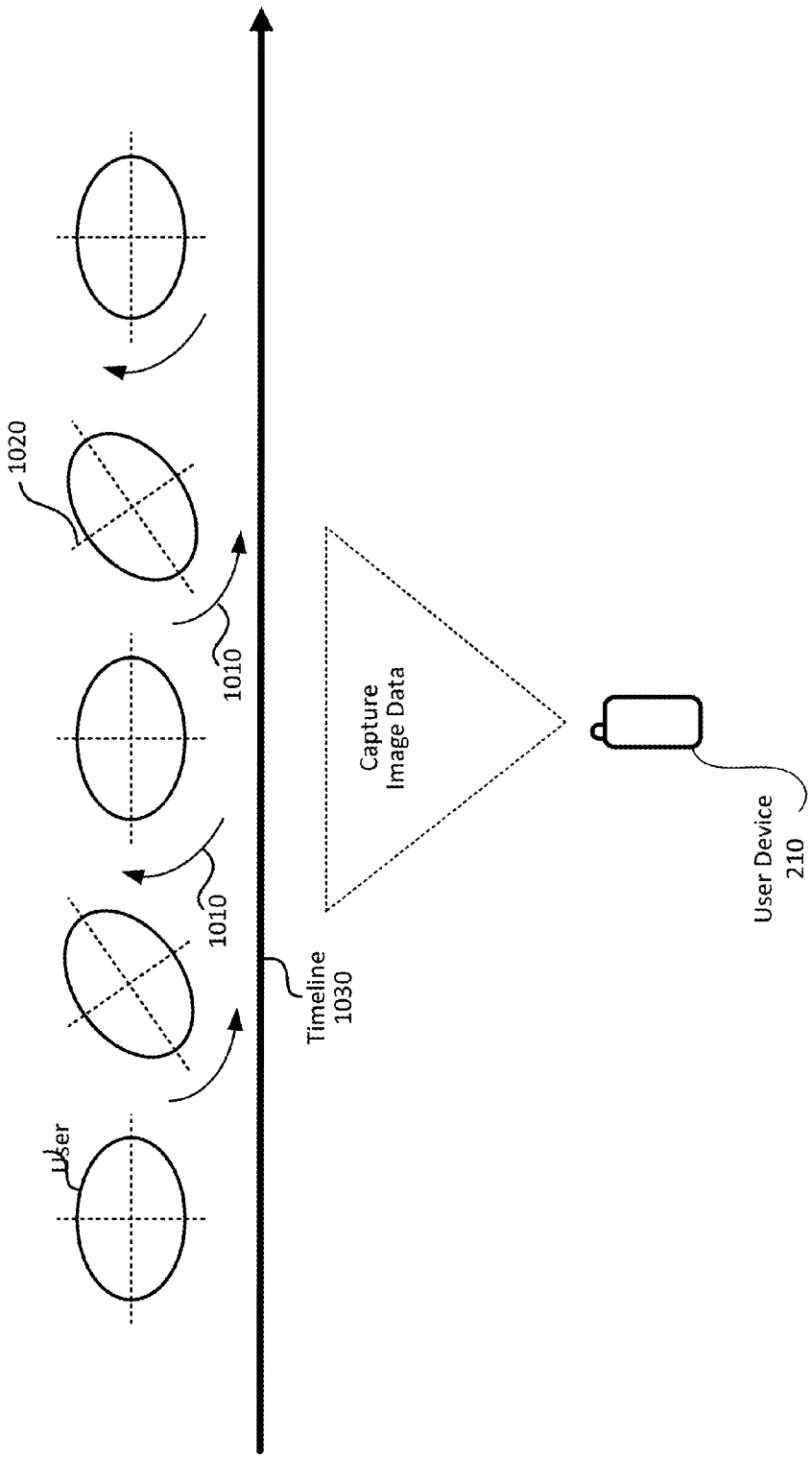
User
1020
1010
1010
Timeline
1030
Capture
Image Data
User Device
210

Fig. 10

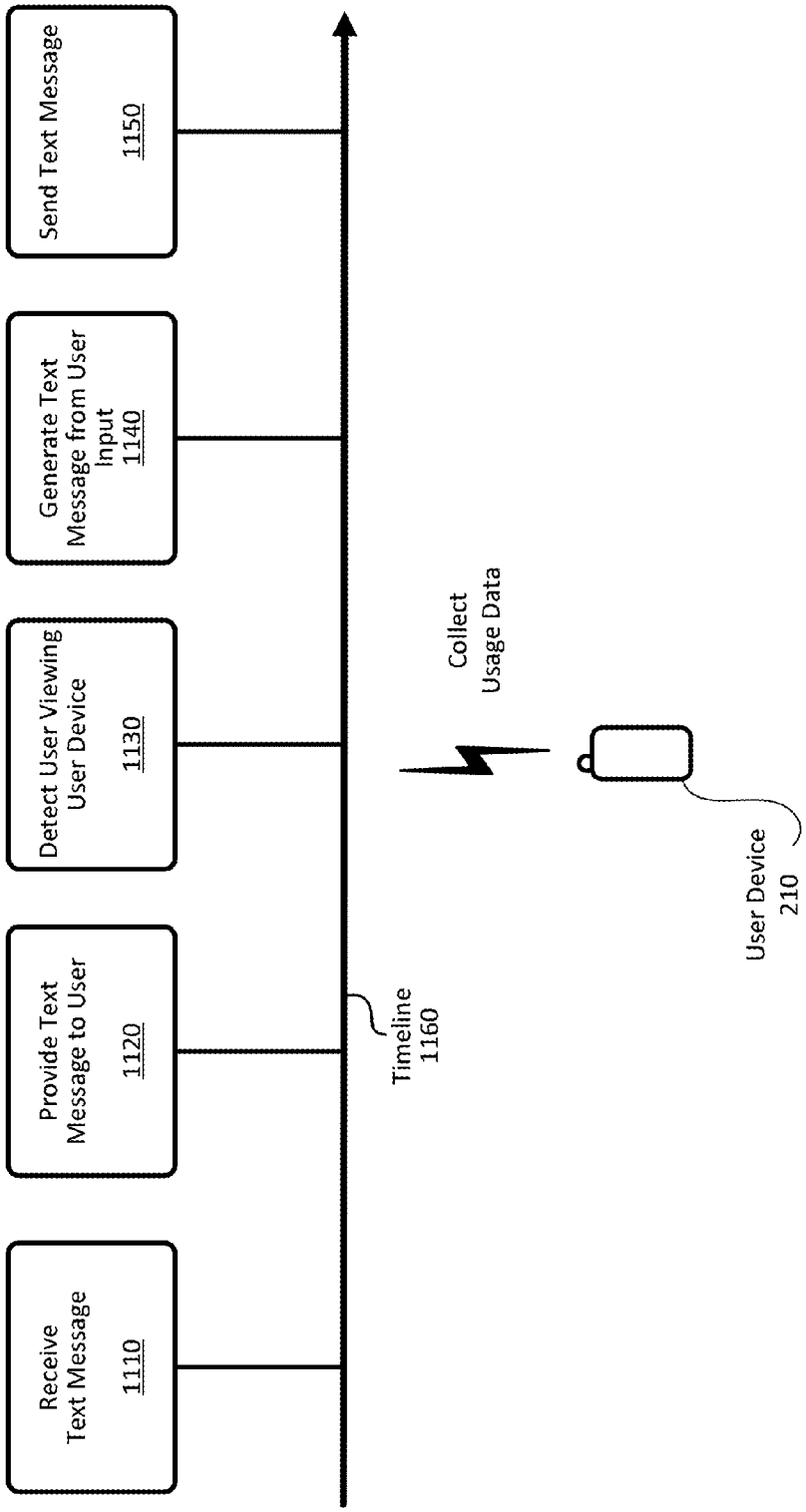
Receive Text Message 1110
Provide Text Message to User 1120
Detect User Viewing User Device 1130
Generate Text Message from User Input 1140
Send Text Message 1150
Timeline 1160
Collect Usage Data
User Device 210

Fig. 11

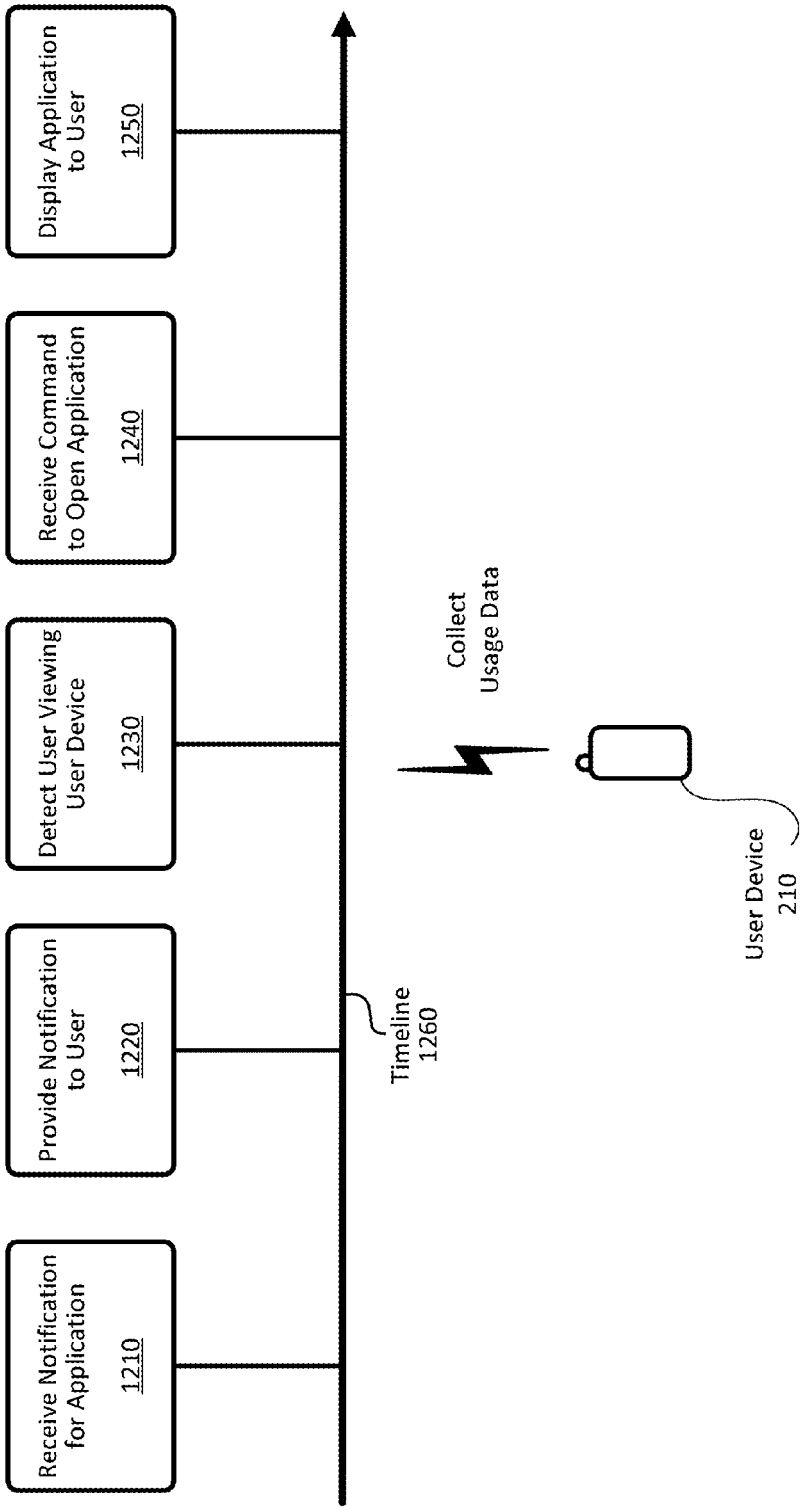
Receive Notification for Application 1210
Provide Notification to User 1220
Detect User Viewing User Device 1230
Receive Command to Open Application 1240
Display Application to User 1250
Timeline 1260
Collect Usage Data
User Device 210

Fig. 12

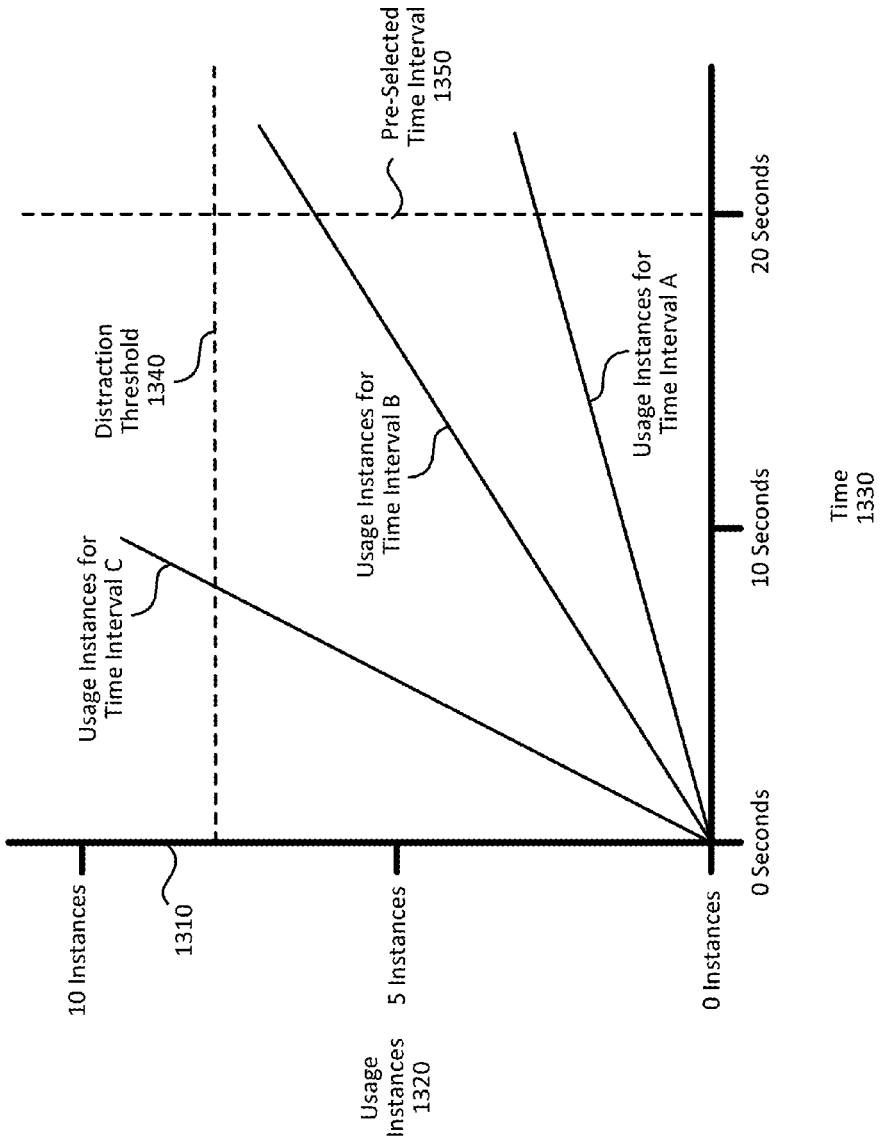
Usage Instances 1320
10 Instances
1310
5 Instances
0 Instances
Usage Instances for Time Interval C
Distraction Threshold 1340
Usage Instances for Time Interval B
Pre-Selected Time Interval 1350
Usage Instances for Time Interval A
0 Seconds
10 Seconds
20 Seconds
Time 1330

Fig. 13

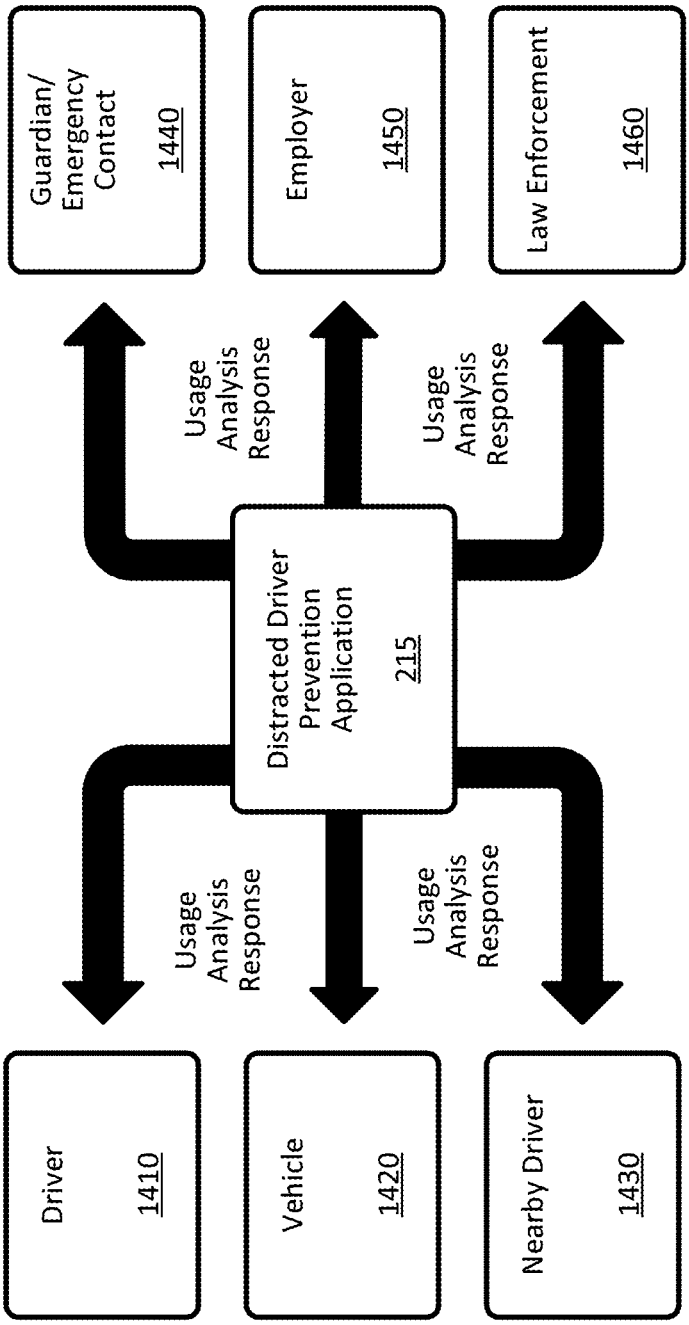
Guardian/ Emergency Contact 1440
Employer 1450
Law Enforcement 1460
Usage Analysis Response
Usage Analysis Response
Distracted Driver Prevention Application 215
Usage Analysis Response
Usage Analysis Response
Driver 1410
Vehicle 1420
Nearby Driver 1430

Fig. 14

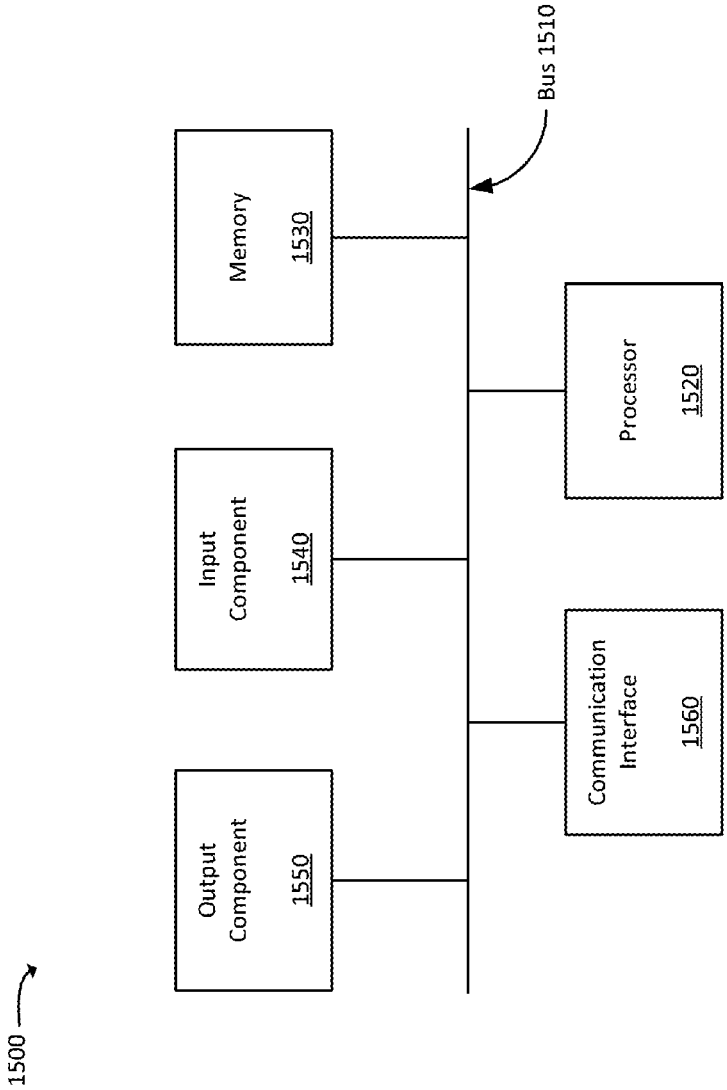
1500
Output Component 1550
Input Component 1540
Memory 1530
Communication Interface 1560
Processor 1520
Bus 1510

FIG. 15

DISTRACTED DRIVER PREVENTION SYSTEMS AND METHODS

BACKGROUND

Cars, trucks, trains, and other types of vehicles are a ubiquitous feature of modern society because of the significant social and economic benefits that they provide. However, the use of such vehicles can pose a danger to people and property when operated under dangerous conditions, such as when a driver of a vehicle is operating a user device (such as a mobile telephone) to send and receive text messages, browse the Internet, view pictures, watch videos, configure settings of the user device, etc.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates an example overview of an implementation described herein;

FIG. **2** illustrates an example environment in which systems and/or methods, described herein, may be implemented;

FIG. **3** illustrates a flowchart of an example process for preventing a user from driving while distracted by a user device;

FIG. **4** illustrates a dataflow diagram of an example implementation for generating a user profile;

FIGS. **5** and **6** illustrate example implementations of determining whether a user is in a driver's seat of a vehicle;

FIG. **7** illustrates an example implementation for collecting usage data;

FIG. **8** illustrates an example of user device orientations;

FIGS. **9** and **10** illustrate example implementations for capturing image data corresponding to a user is viewing a user device;

FIGS. **11** and **12** illustrate example implementations for collecting usage data;

FIG. **13** illustrates an example representation of usage instances over recurring time intervals in determining whether a user is distracted by a user device;

FIG. **14** illustrates an example implementation for responding to a usage data analysis; and

FIG. **15** illustrates example components of one or more devices, according to one or more implementations described herein.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The following detailed description refers to the accompanying drawings. The same reference numbers in different drawings may identify the same or similar elements.

Systems and/or methods, as described herein, may provide techniques for preventing a user of a user device (e.g., a mobile telephone) from driving a vehicle (e.g., a car, a truck, a bus, etc.) while being distracted by the user device. Information, such as whether the user device is being used, how the user device is being used, whether the user is viewing the user device, and other types of information, may be gathered and analyzed to determine whether the user is distracted by the user device while driving, and a response may be executed to prevent the user from driving while distracted, such as alerting the user with an audio warning, deactivating the user device, activating a braking system of the vehicle, activating an assisted driving mode of the vehicle (e.g., where the vehicle is capable of driving on its own), contacting a guardian of the user, an employer of the user, and/or law enforcement, etc.

FIG. **1** illustrates an example overview of an implementation described herein. As shown in FIG. **1**, a user may have a user device (e.g., a smartphone, a tablet computer, etc.) while driving a vehicle. The user device may create a user profile for the user, which may include receiving profile information directly from the user and/or communicating with an application server to obtain profile information. The user profile may include information indicating whether the user is likely to drive while distracted, what types of conditions (e.g., particular routes, times of day, days of the week, etc.) tend to contribute to the user driving while distracted, what types of user device orientations are associated with the user being distracted by the user device while driving, and/or what types of behaviors (e.g., the user glancing at the user device, etc.) the user may exhibit while being distracted by the user device, what types of processes (e.g., text messaging) are associated with distracting the user, etc. The user profile may also, or alternatively, include information from one or more other users that are analogous (e.g., an age, a behavior, etc.) to the user.

The user device may determine whether the user is actually driving the car by determining whether the user is sitting in a driver's seat of a vehicle and/or by determining whether the vehicle is moving. For instance, to determine whether the user is sitting in a driver's seat of the vehicle, the user device may capture image data (e.g., a seat belt, a steering wheel, a gear shifter, etc.) indicative of the user sitting in the driver's seat and/or may communicate with a diagnostics device to determine whether a distance between the user device and the vehicle control system is indicative of the user sitting in the driver's seat. Additionally, or alternatively, the user device may communicate with a position tracking system (e.g., a global positioning system (GPS)) to determine whether the vehicle is actually moving.

The user device may collect usage data while the user drives the vehicle. For instance, the user device may identify an orientation of the user device to determine whether a display of the user device can be viewed by the user, capture image data of the user viewing the display of the user device, monitor inputs/outputs of the user device, and track internal processes executed by the user device. Additionally, or alternatively, the user device may analyze the user profile and/or usage data to determine whether the user is distracted while driving the vehicle. For example, if the user has a history of being distracted while driving (which may include previous instances of the user glancing repeatedly at the user device while driving), has been receiving messages (e.g., text messages) from a cellular network, and is periodically viewing the display of the user device, the user device may determine that the user is distracted.

The user device may respond to the user being distracted in one or more of a variety of ways to prevent the user from continuing to drive while distracted. For example, the user device may play an alarm, a message, or another type of audio prompt to the user, disable one or more features (e.g., the display) of the user device, activate a sound system of the vehicle, communicate with the vehicle control system (e.g., to activate a braking system of the vehicle, to activate assisted driving functions of the vehicle, etc.), communicate with the diagnostics device to create a record of the user driving while distracted (which may later be accessed by a third-party, such as a company renting the vehicle to the user, an insurance company of the user, etc.), communicate with one or more third-party systems to alert nearby drivers that a distracted driver is in the area, contact a parent,

guardian, or emergency contact of the user, contact an employer of the user, contact an insurance company of the user and/or the vehicle, contact local law enforcement, etc. As such, the user device may be used to determine whether a user is actually driving, gather information about the user while the user is driving, analyze the information to determine whether the driver is distracted, and prevent the driver from continuing to drive while distracted.

FIG. **2** is a diagram of an example environment **200** in which systems and/or methods described herein may be implemented. As shown in FIG. **2**, environment **200** may include user devices **210-1** through **210**-M (where M is an integer greater than or equal to 1), distracted driver prevention applications **215-1** through **215**-N (where N is an integer greater than or equal to 1), application server **220**, diagnostics devices **230-1** through **230**-P (where P is an integer greater than or equal to 1), position tracking system **240**, vehicle control systems **250-1** through **250**-Q (where Q is an integer greater than or equal to 1), third-party system **260**, and network **270**.

User device **210** may include a device capable of communicating via a network, such as network **270**. For example, user device **210** may correspond to a mobile communication device (e.g., a smartphone, or a personal digital assistant (PDA)), a portable computer device (e.g., a laptop computer, a tablet computer, a wearable computer), and/or another type of device. In some implementations, user device **210** may display text, display graphics, produce audio signals, produce control signals, etc.

As depicted, user device **210** may include distracted driver prevention application **215** installed on a memory device of user device **210**. Distracted driver prevention application **215** may enable user device **210** (e.g., a processor of user device **210**) to perform one or more of the operations described herein, such as generating a user profile based on information received from a user and/or from application server **220**, determining whether a user is sitting in a driver's seat of the vehicle by collecting image information and/or by communicating with diagnostics device **230**, communicating with position tracking system **240** to determine whether the vehicle is moving, collecting usage data, analyzing the usage data to determine whether the user is distracted while driving, and responding to the usage analysis by prompting the driver to focus on driving the vehicle, disabling one or more features (e.g., a display) of user device **210**, communicating with vehicle control system **250** to control driving functions (e.g., activate a braking system of the vehicle, turn off an engine (not shown) of the vehicle, etc.), communicating with diagnostics device **230** to log instances of the user driving while distracted, and/or communicating with third-party system **260** (e.g., to warn drivers of other vehicles that the user is driving while distracted, contact a guardian of the user, contact an employer of the user, contact local law enforcement, etc.).

Application server **220** may include one or more computing devices, such as a server device or a collection of server devices. Application server **220** may operate as an application server for distracted driver prevention application **215** of user device **210**. In some implementations, application server **220** may send profile information (e.g., identification information, application preferences, driver behavior information, etc.) to user device **210** to assist user device **210** in generating and/or enhancing a user profile. Additionally, or alternatively, application server **220** may receive profile information from user device **210** and, for example, use the profile information to develop a user profile for one or more analogous drivers. Application server **220** may receive profile information from one or more other devices as well, such as from a desktop computer (not shown) being operated by a third party (e.g., a guardian or employer of the user) to create and/or modify the user profile for the user. In some implementations, application server **220** may operate as a portal for a third party to exercise one or more controls over the vehicle (possibly via user device **210** and vehicle control system **250**), such as activating a braking system of the vehicle, generating an audio signal via a radio of the vehicle, turning off the engine of the vehicle, activating assisted driving functions of the vehicle, etc.

Diagnostics device **230** may include a device installed in the vehicle and capable of communicating with user device **210**. For example, diagnostics device **230** may include a wireless electronic device (e.g., a Bluetooth device) installed in the vehicle and capable of establishing a wireless connection with user device **210**. Diagnostics device **230** may include a removable device that is plugged into an on-board diagnostics ("OBD") port (e.g., an OBD-II port) of the vehicle. Diagnostics device **230** may assist user device **210** in determining whether the user of user device **210** is driving the vehicle by helping determine whether the user is located in a driver's seat of the vehicle. Additionally, or alternatively, diagnostics device **230** may receive usage data and/or instances of the user driving while distracted, which may later be provided to a third party such as law enforcement, an insurance company, a company renting the vehicle to the user, and/or another type of entity. Additionally, or alternatively, diagnostics device **230** may perform one or more other functions, such as tracking a speed of the vehicle, determining whether the vehicle is on or off, etc. While diagnostics device **230** may be installed in the vehicle in some implementations, in other implementations, diagnostics device **230** may include a removable device that is plugged into a diagnostics device that comes standard with the vehicle. In some implementations, diagnostics device **230**, and/or one or more functions thereof, may be included in vehicle control system **250**, or vice versa.

Position tracking system **240** may include one or more computing devices, such as a server device or a collection of server devices capable of determining changes in location of user device **210**. In some implementations, position tracking system **240** may include a GPS system, a system that performs cellular triangulation techniques, and/or one or more other types of wireless systems capable of tacking the geographical movements of user device **210**. Position tracking system **240** may be integrated into user device **210** and/or the vehicle. In some implementations, a position tracking system of the vehicle may be used to provide user device **210** with the geographical movements of user device **210**. Additionally, or alternatively, when user device **210** is stationary for a period of time, position tracking system **240** may provide specific geographical location information to assist user device **210** in differentiating between whether, for example, the user has pulled the vehicle over in order to operate user device **210** in a safe environment or whether the user is merely stopped at a traffic light, in a traffic jam, etc.

Vehicle control system **250** may include one or more computing devices within the vehicle. In some implementations, vehicle control system **250** may be integrated in with the vehicle (e.g., installed by a manufacturer or a vendor of the vehicle), or installed later (e.g., by a user, a company renting the vehicle to the user, etc.). Vehicle control system **250** may be an OBD-II device and/or may communicate via another interface. In some implementations, vehicle control system **250** may include a device capable of controlling one or more functions of the vehicle, such as the braking system

of the vehicle, the engine of the vehicle (e.g., whether the engine is on or off), a dashboard lighting system within the vehicle, a radio or other type of media system within the vehicle, a steering system, etc. Vehicle control system **250** may be capable of communicating with user device **210** to prevent a driver from driving while distracted by activating the braking system, turning the engine of the vehicle off, toggling the dashboard lighting system on and off and/or changing the lighting and/or color configuration of the dashboard lighting system, activating the radio or other media system of the vehicle, and/or by controlling one or more other systems with the vehicle.

Network **270** may include one or more wired and/or wireless networks. For example, network **270** may include a cellular network (e.g., a second generation (2G) network, a third generation (3G) network, a fourth generation (4G) network, a fifth generation (5G) network, a long-term evolution (LTE) network, a global system for mobile (GSM) network, a code division multiple access (CDMA) network, an evolution-data optimized (EVDO) network, or the like), a public land mobile network (PLMN), and/or another network. Additionally, or alternatively, network **270** may include a local area network (LAN), a wireless LAN (WLAN), a wide area network (WAN), a metropolitan network (MAN), the Public Switched Telephone Network (PSTN), an ad hoc network, a managed Internet Protocol (IP) network, a virtual private network (VPN), an intranet, the Internet, a fiber optic-based network, and/or a combination of these or other types of networks.

The quantity of devices and/or networks in environment **200** is not limited to what is shown in FIG. **2**. In practice, environment **200** may include additional devices and/or networks, fewer devices and/or networks, different devices and/or networks, or differently arranged devices and/or networks than illustrated in FIG. **2**. Also, in some implementations, one or more of the devices of environment **200** may perform one or more functions described as being performed by another one or more of the devices of environment **200**. Devices of environment **200** may interconnect via wired connections, wireless connections, or a combination of wired and wireless connections.

FIG. **3** illustrates a flowchart of an example process **300** for preventing a user from driving while distracted by user device **210**. In some implementations, process **300** may be performed by user device **210** (e.g., by distracted driver prevention application **215**). In some implementations, some or all of the blocks of process **300** may be performed by one or more other devices. A description of FIG. **3** is provided below with reference to FIGS. **4-14**, which provide examples of the operations presented in FIG. **3**. A description of FIG. **3** is provided below with reference to FIGS. **4-14**, which provide examples of the operations presented in process **300** of FIG. **3**.

As shown in FIG. **3**, process **300** may include generating a user profile (block **310**). For example, user device **210** (e.g., distracted driver prevention application **215**) may generate a user profile. In some implementations, user device **210** may generate the user profile based on profile information received from one or more sources, such as a user of user device **210** and/or from application server **220**. Additionally, or alternatively, the profile information may be received by user device **210** at one or more times. For instances, some profile information may be received directly from the user and/or application server **220** the first time the user runs distracted driver prevention application **215**, more profile information may be received as usage data is collected by distracted driver prevention application **215**, and even more profile information may be received after usage information is applied to the user profile thereby triggering the acquisition of additional profile information in the form of analogous user information. As such, the information that makes up a user profile may not only be received from multiple sources, but may also be received at multiple times.

Profile information may include, for example, identification information (e.g., a name of the user, an age of the user, etc.), vehicle information (e.g., vehicle make, vehicle model, vehicle identification number (VIN), etc.), contact information (e.g., a telephone number, an email address, a home address, etc.), application preferences information (e.g., one or more application settings that the user may prefer to have enabled or disabled), and/or one or more other types of information. Additionally, or alternatively, the profile information may include response information, such as how user device **210** should respond to the user being distracted by user device **210** while driving (e.g., by playing back a recorded message, temporarily disabling user device **210**, contacting a guardian, contacting an employer, activating a braking system of the vehicle, etc.), distraction information (e.g., usage data describing previous instances of the user driving while distracted, usage data describing an orientation of user device **210** associated with the user driving while distracted, usage data describing physical movement patterns of a user's body associated with the user driving while distracted, usage data describing internal processes of user device **210** associated with the user driving while distracted, etc.), and/or analogous user information (e.g., profile information relating to other users that are determined to be analogous to the user of user device **210** in one or more ways, such as age, physical attributes, diseases, disabilities, disorders, etc.).

FIG. **4** illustrates a dataflow diagram of an example implementation for generating a user profile (e.g., at block **310**). As depicted, distracted driver prevention application **215**, which may be installed on user device **210**, may receive one or more types of profile information, such as identification information **410**, distraction information **420**, analogous user information **430**, and response information **440**, and/or may use the profile information **410-440** to create and/or update user profile **450**. The profile information **410-440** may be received by distracted driver prevention application **215** at different times and from different sources.

For instance, when user device **210** initiates distracted driver prevention application **215** for the first time, identification information **410**, response information **440**, and one or more other types of profile information (e.g., contact information, vehicle information, etc.) may be received from the user in order to create a user profile initially. Some or all of the profile information received from the user may be sent to application server **220**, and in response, analogous user information **440** may be received from application server **220** to further enhance user profile **460**. Application server **220** may identify analogous users by identifying a similarity and/or a combination of similarities between two users. For instance, analogous users may have similar ages, schedules, and/or driving records, and/or may have one or more other types of similarities.

Distraction information may be received by distracted driver prevention application **215** in response to collecting usage data while the user drives a vehicle, which may also, or alternatively, be used to generate and/or enhance driver profile **450**. If driver profile **450** is later modified (e.g., by additional identification information, distraction information, etc.), distracted driver prevention application **215** may update user profile **450** by obtaining different and/or addi-

tional analogous user information **430** from application server **220**, since user profile **450** may have become analogous to different and/or additional users than was previously the case. As such, distracted driver prevention application **215** may receive one or more types of profile information **410-440** at one or more times and/or from one or more sources, resulting in a dynamically customized user profile **450**.

Referring again to FIG. **3**, process **300** may include determining whether a user is driving (block **320**). For example, user device **210** may determine whether a user is driving. In some implementations, user device **210** may determine whether the user is driving by determining whether the vehicle is moving and/or determining whether the user is sitting in a driver's seat of a vehicle. User device **210** may determine that the vehicle is moving by, for example, communicating with position tracking system **240**, vehicle control system **250** (e.g., to determine whether the engine of the vehicle is running, whether an odometer is registering movement, etc.), and/or one or more other types of systems capable of determining whether the vehicle is moving. User device **210** may determine whether the user is sitting in a driver's seat of a vehicle by collecting image data (e.g., a seatbelt, steering wheel, a gear shifter, etc.) that is indicative of the user sitting in the driver's seat of the vehicle and/or by communicating with an diagnostics device **230** of the vehicle. For instance, if the shoulder strap of a seatbelt is stretching diagonally from upper left to lower right, user device **210** may determine, or treat such as image as evidence, that the user of user device **210** is driving.

FIG. **5** illustrates an example implementation for determining whether a user is in a driver's seat of a vehicle. As shown, user device **210** may capture image data using a front-side camera of user device **210** and a back-side camera of user device **210**. Each camera of user device **210** may capture image data to define the local environment of user device **210**, which may enable user device **210** to infer the location of the user with the vehicle. For instance, the front-side camera of user device **210** may capture image data corresponding to a seatbelt across the chest area and/or lap of the user, while the back-side camera may capture image data corresponding to a steering wheel of the vehicle. Based on the image data captured by the front-side camera, user device **210** may infer that the user is located in a vehicle (and intends to be there for a while since the seatbelt is fastened), and/or based on the image data captured by the back-side camera user device **210** may infer that the user is located in the driver's seat of the vehicle.

Additional examples of image data that may be collected by user device **210** to determine the location of the user within the vehicle may include one or more driver console features (e.g., a speedometer, an odometer, etc.), a gear shifter, a center console, a glove compartment, a rearview mirror, a back seat, a front seat, a window, a location of another passenger, etc. For example, image data of a gear shifter with a glove compartment in the background may be indicative of the user being located in the driver's seat, whereas image data of a front seat may be indicative of the user being located in a back seat. As such, user device **210** may gather image information using one or more cameras to determine whether a user is located in a driver's seat.

FIG. **6** illustrates another example implementation for determining whether a user is in a driver's seat of a vehicle. As shown, one or more user devices **210** may communicate with diagnostics device **230** to determine a distance between user device **210** and diagnostics device **230**. Ascertaining the distance between user device **210** and diagnostics device **230** may enable user device **210** to infer whether the user of user device **210** is located in a driver's seat of the vehicle. The distance between user device **210** and diagnostics device **230** may be collected, for example, by measuring the time required for a signal to be transmitted between user device **210** and diagnostics device **230**, by measuring a signal strength between user device **210** and diagnostics device **230**, and/or by one or more other types of distance measuring techniques.

The measured distance between user device **210** and diagnostics device **230** may be calculated based on one or more measurements. For instance, since the distance between user device **210** and diagnostics device **230** may change (e.g., as the user uses user device **210**, if a use device is passed to different passengers within the vehicle, etc.), the distance between user device **210** and diagnostics device **230** may be measured periodically (e.g., every 5 seconds) and/or may consist of an average of multiple distances measured over a period of time. While the distance between user device **210** and diagnostics device **230** may be measured by user device **210**, diagnostics device **230** may also, or alternatively, measure the distance. For instance, diagnostics device **230** may measure distances for all user devices **210** in the vehicle and notify user device **210-1** that the user of user device **210-1** is located in the driver's seat since user device **210-1** corresponds to a preselected distance (or range of distances) indicative of the user of user device **210-1** being in the driver's seat. Additionally, or alternatively, when diagnostics device **230** is located near the driver's seat (as shown in FIG. **6**), diagnostics device **230** may measure distances for all user devices **210** in the vehicle and notify user device **210-1** that the user of user device **210-1** is located in the driver's seat since user device **210-1** is the closest user device **210** to diagnostics device **230**.

Referring again to FIG. **3**, process **300** may include collecting usage data (block **330**). For example, user device **210** may collect usage data. Usage data may include one or more types of information that may be relevant to determining whether the user of user device **210** is, or may become, distracted by user device **210**. Examples of usage data may include a communication between user device **210** and network **270**, a communication between user device **210** and the user of user device **210**, and/or an internal process executed by user device **210**. Usage data may additionally, or alternatively, include one or more other types of information, such as timing information. For instance, user device **210** may collect timing information corresponding to a communication between user device **210** and network **270**, a communication between user device **210** and the user of user device **210**, and/or an internal process performed by user device **210**.

FIG. **7** illustrates an example implementation for collecting usage data. As shown, user device **210** may collect usage data associated with a communication between user device **210** and network **270**, a communication between user device **210** and the user of user device **210**, and/or internal process **710** performed by user device **210**. Usage data associated with a communication between user device **210** and network **270** may include sending and/or receiving information associated with a text message, an email, a telephone call, a video conference, a search engine query, a search engine query result, information corresponding to browsing the Internet, information associated with an application installed on user device **210** (e.g., a push notification), a software update for user device **210**, and/or one or more other types of information sent to, or received from, network **270**.

Usage information associated with a communication between user device **210** and the user of user device **210** may include any type of input/output communicated between the user and user device **210**. Inputs from the user may include active inputs, such as the user pressing a button or typing information into user device **210**, providing audio commands via a microphone of user device **210**, etc., and/or passive inputs, such as user device **210** detecting a face of the user when the user glances at a display of user device **210**, detecting a change in orientation of user device **210** when the user moves user device **210**, etc. Outputs from user device **210** to the user may include an audio output, a visual output, and/or a physical output (e.g., a vibration). Examples of outputs from user device **210** to the user may include displaying a graphical interface on a display of user device **210**, outputting a bell, a beep, a pre-recorded audio message, and/or another type of audio output to the user, and/or causing user device **210** to vibrate in response to, for example, receiving a telephone call, a text message, an email, etc.

Usage data associated with internal processes **710** of user device **210** may include user device **210** executing one or more types of operations, one or more of which may be associated with an input/output to network **270** and/or the user. Examples of usage data associated with internal process **710** may correspond to executing a command from the user of user device **210** (e.g., accessing a list of contacts, initiating a telephone call, generating a text message based on text received from the user, etc.) and/or processing information received from network **270** (e.g., generating graphical information for display based on a text message, an email, a push notification, etc., providing a notification from network **270** to the user of user device **210**, etc.). Additionally, or alternatively, examples of usage data associated with internal process **710** may corresponding to a purely internal operation (e.g., detecting a trigger associated with a schedule or alarm clock feature of user device **210**, detecting a position or orientation change of user device **210**, etc.) and/or one or more other types of operations that may be relevant to determining whether the user of user device **210** is, or may become, distracted by user device **210**. Additional examples of collecting usage data are provided below with reference to FIGS. **8-12**.

FIG. **8** illustrates an example of user device orientations. As shown, user device **210** may have a horizontal orientation **820** with respect to vehicle floor **810**, a vertical orientation **830** with respect to vehicle floor **810**, and/or a combination of a horizontal orientation and a vertical orientation with respect to vehicle floor **810**. User device **210** may have a primarily horizontal orientation (**820**) when user device **210** is, for example, placed on a relatively flat surface within the vehicle (e.g., a center console, an empty passenger seat, a lap of the user, etc.), held by the user in a relatively horizontal position, etc. As another example, user device **210** may have a primarily vertical orientation **830** when user device **210** is, for example, in a user device mount installed within the vehicle, held in a vertical position by the user, propped up against a driver console of the vehicle, etc. In some implementations, the orientation of user device **210** may change. For instance, the user may position user device **210** in horizontal position **820**, receive a text message, and manually move user device **210** from horizontal position **820** to vertical positon **830** in order to view the text message.

As mentioned above, user device **210** may collect usage data corresponding to the orientation (and/or change in orientation) of user device **210**. User device **210** may detect an orientation of user device **210** using an accelerometer within user device **210**, one or more cameras of user device **210**, and/or one or more other devices of user device **210**. For instance, an accelerometer of user device **210** may indicate that user device **210** is in a horizontal orientation or a vertical position; however, a front-side camera and/or a back-side camera of user device **210** may determine whether user device **210** is laying with a display-side of user device **210** facing upward or a display-side of user device **210** facing downward. For example, if the back-side camera of user device **210** detects mostly blackness, whereas the front-side camera of user device **210** detects non-blackness (e.g., a roof of the vehicle), user device **210** may determine that user device **210** is laying on a horizontal surface with the display side of user device **210** facing upward (e.g., horizontal orientation **820-1**). However, if the front-side camera of user device **210** detects only blackness, whereas the back-side camera of user device **210** detects non-blackness (e.g., a roof of the vehicle), user device **210** may determine that user device **210** is laying on a horizontal surface with the display side of user device **210** facing downward (e.g., horizontal orientation **820-2**).

Determining an orientation of user device **210** may better enable user device **210** to determine whether the user is distracted by user device **210**. For instance, determining if the display-side of user device **210** is upward or downward may help determine whether the user of user device **210** is distracted by user device **210** since, for example, the user would be unable to view the display of user device **210** when user device **210** is facing downward. Additionally, or alternatively, if user device **210** undergoes an orientation change from horizontal to vertical shortly after receiving a text message, the change in orientation may be used to infer that the user is reading the text message and, therefore, distracted by user device **210**. Additionally, or alternatively, determining a change in orientation may help gather other types of usage data. For instance, image data indicative of the user viewing a display of user device **210** may be different depending on whether user device **210** is in horizontal orientation **820**, vertical orientation **830**, and/or a combination thereof, since the user may need to tilt his or her head in order to view the display of user device **210**. As such, determining the orientation of user device **210** may enable user device **210** to be responsive to different types of image data based on the orientation of user device **210**.

FIGS. **9** and **10** illustrate example implementations for capturing image data corresponding to a user is viewing user device **210**. As shown in FIG. **9**, user device **210** may collect image data of a user viewing user device **210**, which may include periodic vertical angular movements of the user's head and neck toward user device **210**. For instance, as the user views a display of user device **210**, the head of the user may pivot up and down in a pattern consistent with the user periodically glancing at user device **210**, as represented by changes in angular movement arrows **910** and reference grid **920** along timeline **930**. Such vertical angular movements may be detected by a camera (e.g., a front-side camera using facial recognition technologies) of user device **210**, and collected by user device **210** as usage data. User device **210** may also, or alternatively, collect degree, time, frequency, and other types of information regarding the user viewing user device **210** to, for example, determine how severely the user is distracted by user device **210**. In some implementations, user device **210** may do so by, for example, comparing the image data collected by user device **210** against reference data (e.g., data that indicates a lower level of distraction, data that indicates a greater level of distraction, etc.).

As shown in FIG. **10**, user device **210** may collect image data of a user viewing user device **210**, which may include horizontal angular movements of the head of the user. For instance, as the user views a display of user device **210**, the head of the user may pivot from one side to another in a pattern consistent with the user periodically glancing at user device **210**, as represented by changes in angular movement arrows **1010** and reference grid **1020** along timeline **1030**. Such horizontal angular movements may be detected by a camera (e.g., a front-side camera using facial recognition technologies) of user device **210**, and collected by user device **210** as usage data. User device **210** may also, or alternatively, collect degree, time, frequency, and other types of information regarding the user viewing user device **210** to, for example, determine how severely the user is distracted by user device **210**. In some implementations, user device **210** may do so by, for example, comparing the image data collected by user device **210** against reference data (e.g., data that indicates a lower level of distraction, data that indicates a greater level of distraction, etc.).

FIGS. **11** and **12** illustrate further example implementations for collecting usage data. As shown in FIG. **11**, user device **210** may collect usage data corresponding to operations **1110-1150** along timeline **1160**. User device **210** may receive a text message (block **1110**) via, for example, network **270**. User device **210** may provide the text message to a user of user device **210** by, for example, generating a prompt (e.g., a beep, a ding, a ring, a vibration, etc.), displaying the text message to the user, and/or providing a text message interface to the user. The text message interface may include the text message received from network **270** and/or a text box for responding to the text message. User device **210** may detect user viewing user device **210** (block **1130**), which may include, for example, one or more operations (e.g., detecting an orientation of user device **210**, detecting the user viewing user device **210**, etc.) described above with reference to FIGS. **8-10**. User device **210** may generate a text message based on information received from the user (block **1140**) and/or send the text message (block **1150**) in response to the text message. Usage data corresponding to one or more of operations **1110-1150** may be collected by user device **210** and/or time information (e.g., a timestamp) corresponding to one or more of operations **1110-1150**. Collecting usage data may help determine whether, and/or how severely, the user of user device **210** is distracted by user device **210**.

As shown in FIG. **12**, user device **210** may collect usage data corresponding to operations **1210-1250** along timeline **1260**. User device **210** may receive a notification (e.g., a push notification) corresponding to an application (block **1210**) installed on user device **210**, such as a news application, a social networking application, an email application, a messaging application, an application for updating other applications, etc. User device **210** may provide the notification to a user of user device **210** (block **1220**) by, for example, generating a prompt (e.g., a beep, a ding, a ring, a vibration, etc.), displaying a visual prompt (e.g., a summary and/or description corresponding to the notification, etc.). User device **210** may detect the user viewing user device **210** (block **2130**), which may include one or more operations (e.g., detecting an orientation of user device **210**, detecting the user viewing user device **210**, etc.) described above with reference to FIGS. **8-10**. User device **210** may receive a command from the user to open the application corresponding to the notification (block **1240**), and user device **210** may display the application to the user (block **1250**). Usage data corresponding to one or more of operations **1210-1250** may be collected by user device **210** and/or time information (e.g., a timestamp) corresponding to one or more of operations **1210-1250**. Collecting usage data may help determine whether, and/or how severely, the user of user device **210** is distracted by user device **210**.

Referring again to FIG. **3**, process **300** may include analyzing usage data to determine whether a user is distracted while driving (block **340**). For example, user device **210** may analyze usage data to determine whether a user is distracted while driving. User device **210** may implement one or more of a variety of techniques for analyzing usage data to determine whether driver **510** is distracted.

For example, user device **210** may define a distraction threshold based on one or more aspects of user profile **450** and/or one or more types of usage data (e.g., whether the user has a general propensity to be distracted by user device **210** while driving, whether the user is driving at a particular time, for a particular duration, and/or along a particular route where the user and/or analogous users have been distracted by user device **210** before, what type of media is being played by the vehicle (e.g., users may have a lower propensity to be distracted by user device **210** playing music than by user device **210** displaying an image, playing a video, etc.), the orientation of user device **210**, whether the user has been, or is, viewing user device **210**, inputs/outputs of user device **210**, etc.), and determine that the driver is distracted when usage data exceeds the distraction threshold. Additionally, or alternatively, user device **210** may define distraction thresholds for different aspects of user profile **450** and/or one or more types of usage data, and determine that a user is distracted when user profile **450** and usage data exceed all, a pre-selected percentage, a pre-selected number of the drowsiness thresholds, and/or a pre-selected combination of the distraction thresholds. In some implementations, user device **210** may also, or alternatively, use one or more default settings when defining a distraction threshold and comparing usage data to the distraction threshold.

In some implementations, user device **210** may define distraction thresholds for different levels of confidence with respect to the user being distracted. For instance, user device **210** may define a distraction threshold that corresponds to merely being suspicious that a user is distracted and another distraction threshold for being certain that the user is distracted. In such implementations, defining distraction thresholds for different levels of confidence may, for example, enable user device **210** to customize responses to the user being distracted according to a level of confidence regarding the user actually being distracted. For example, when user device **210** is merely suspicious of the user being distracted, user device **210** may provide an audio message prompting the user to state whether he or she is distracted; however, when user device **210** is certain of the user being distracted, user device **210** may disable one or more features (e.g., a display, a keyboard, an application, a text message service, an email service, a data service, etc.) of user device **210**. In some implementations, the feature disabled may correspond to a feature identified by user device **210** as being a source and/or a primary source (e.g., a feature that is a greater distraction than other distracting features of user device **210**) of distraction for the user. A distraction threshold may be defined using one or more quantitative and/or qualitative measurement techniques, which may be implemented using one or more indexing techniques for each type of information upon which the distraction threshold is based. As such, user device **210** may analyze usage data to determine whether the user is distracted in one or more of a variety of ways.

FIG. **13** illustrates an example representation of usage instances over recurring time intervals in determining whether a user is distracted by user device **210**. As shown in FIG. **13**, the representation may include graph **1310** that includes vertical axis of usage instances **1320**, horizontal axis of time **1130**, distraction threshold **1340**, and pre-selected time interval **1350**. User device **210** may determine that a user is distracted when a number of usage instances **1320** exceeds distraction threshold **1340** within pre-selected time interval **1350**.

A usage instance may include one or more types of usage data. For example, a single usage instance may include a single type of usage data, such as the user viewing a display of user device **210**, the user accessing an application installed on user device **210**, a user inputting information into user device **210**, etc. Additionally, or alternatively, a single usage instance may include a collection of related usage data (e.g., a sequence of events), such as user device **210** receiving data, displaying the data to a user, and determining that the user has viewed the data. In such implementations, the usage data specifying a sequence of events to a usage instance may specify a pre-selected period of time (e.g., 2 seconds, 5 seconds, 10 seconds, etc.) within which the usage data should be collected. Additionally, or alternatively, one type of usage data may be given different consideration than another type of usage data. For instance, the user unexpectedly viewing user device **210** to check the time may not be given the same weight (in terms of distraction threshold **1340** and/or usage instance **1320**) as the user viewing user device **210** 2 seconds after a text message has been received (presumably to read and possibly respond to the text message). As such, the relationship between types of usage data and a usage instance by user device **210** may be 1 to 1, many to 1, 1 to many, or many to many. In some implementations, the type (or types) of usage data required for a single usage instance may depending, at least in part, on user profile **450** corresponding to the user of user device **210**.

As shown, graph **1310** includes usage instances for three different time intervals, time interval A, time interval B, and time interval C. In this example, the number of instances for time intervals A and B failed to equal or exceed distraction threshold **1340**. However, the number of instances of time interval C exceeded distraction threshold **1340** within pre-selected time interval **1350**. As such, user device **210** may determine that the user is not distracted by user device **210** during time intervals A and B; however, user device **210** may determine that the user is distracted during time interval C and may respond accordingly. In some implementations, each time interval may be a successive time interval (e.g., time interval B may begin at the conclusion of time interval A, time interval C may begin at the conclusion of time interval B, and so on). In some implementations, a time interval may overlap with one or more time intervals. For instance, time interval B may begin at any point during time interval A, time interval C may begin at any point during time interval A and/or B, etc. In such implementations, user device **210** may determine that a user is distracted if a number of usage instances ever exceeds distraction threshold **1340** within any time period that is less than, and/or equal to, pre-selected time interval **1350**.

Returning again to FIG. **3**, process **300** may include responding to the usage data analysis (block **350**). For example, user device **210** may respond to the usage data analysis performed at block **340**. In some implementations, user device **210** may respond in one or more of a variety of ways, such as alerting the user with an audio signal, disabling one or more features of user device **210**, reporting usage data and/or a determination that the user is driving while distracted to diagnostics device **230**, activating a braking system of the vehicle, activating a radio or other media device of the vehicle, communicating a warning to other drivers that a driver in their vicinity is driving while distracted, contacting a guardian, an emergency contact, an employer, and/or law enforcement, etc. In some implementations, user device **210** may respond to the user being distracted based user profile **450**. User device **210** may also, or alternatively, respond to the user being distract based on one or more default settings of distracted driver prevention application **215**.

In some implementations, user device **210** may respond to a usage data analysis by collecting usage data (See, block **330**). For example, if user device **210** analyzes usage data for a user and determines that the user is not distracted, user device **210** may respond to the analysis of the usage data by continuing to collect usage data. User device **210** may also, or alternatively, respond to a usage data analysis by continuing to collect usage data when the usage data analysis shows that the driver is distracted. As mentioned above, collected usage data, usage data analyses, and/or responses to usage data analyses may be used to update user profile **450** and/or sent to application server **220** to create and update user profiles **450** of analogous drivers.

FIG. **14** illustrates an example implementation for responding to a usage data analysis. As shown user device **210** may respond to a usage data analysis by communicating a driving analysis response to one or more entities (e.g., driver **1410** (e.g., the user of user device **215**), vehicle **1420**, nearby driver **1430**, guardian/emergency contact **1440**, employer **1450**, law enforcement **860**, etc.). A usage data analysis response may include one or more types of operations, such as alerting driver **1410** with an audio signal, reporting usage data and or a determination that driver **1410** is distracted to diagnostics device **230** of vehicle **1420**, activating assisted driving feature of vehicle **1420**, communicating to vehicle **1420** to activate a braking system of vehicle **1420**, activating a radio or other media device of vehicle **1420**, communicating a warning to one or more nearby drivers **1430**, contacting guardian/emergency contact **1440** of driver **1410**, notifying employer **1450** that driver **1410** is driving while distracted by user device **210**, notifying law enforcement **1460** that driver **1410** is driving while distracted by user device **210**, etc. Depending on the implementation, a usage data analysis response may include one or more types of communications, such as an audio signal, a telephone call, a text message, an email, a voicemail, a log file, etc. Additionally, or alternatively, a usage data analysis response may include one or more types of information, such as an alarm, pre-recorded audio signal, a written message, a description of the geographic location of vehicle **1420**, etc.

In some implementations, a usage data analysis response may include enabling a guardian, employer, or other entity to contact driver **1410** and/or vehicle **1420**. Doing so may enable guardian **1440**, employer **1450**, or law enforcement **1460** to, for example, speak with driver **1410** to verify whether driver **1410** is distracted, to convince driver **1410** to pull over or drive to a rest stop, etc. Additionally, or alternatively, doing so may enable guardian **1440**, employer **1450**, or law enforcement **1460** to exercise control over vehicle **1420** to, for example, activate the braking system of vehicle **1420**, turn off the engine of vehicle **1420**, etc. As such, distracted driver prevention application **215** may enable user device **210** to respond to a usage data analysis

in one or more of a large variety of ways to prevent a driver from driving while distracted by user device **210**. In some implementations, communications between the driver and user device **210** in a manner that does not cause further distraction on the part of the driver from driving.

As described above, FIGS. **4-14** provide example implementations of operations shown in FIG. **3**. It should be noted, however, that while FIG. **3** shows a flowchart diagram of an example process **300** for preventing a user from driving while distracted, in other implementations, a process for preventing a user from driving while distracted may include fewer operations, different operations, differently arranged operations, and/or additional operations than depicted in FIG. **3**. For instance, in implementations where user device **210** disables one or more features of user device **210** to prevent the user from being distracted, user device **210** continue to monitor the movements of user device **210** and/or re-enable the disabled features of user device **210** upon determining that the user is no longer driving the vehicle. In addition, while FIGS. **4-14** show example implementations with various features, in other implementations, example implementations may include fewer features, different features, differently arranged features, and/or additional features than the features depicted in FIGS. **4-14**.

FIG. **15** is a diagram of example components of device **1500**. One or more of the devices described above (e.g., with respect to FIGS. **1**, **2**, and **5-12**) may include one or more devices **1500**. Device **1500** may include bus **1510**, processor **1520**, memory **1530**, input component **1540**, output component **1550**, and communication interface **1560**. In another implementation, device **1500** may include additional, fewer, different, or differently arranged components.

Bus **1510** may include one or more communication paths that permit communication among the components of device **1500**. Processor **1520** may include a processor, microprocessor, or processing logic that may interpret and execute instructions. Memory **1530** may include any type of dynamic storage device that may store information and instructions for execution by processor **1520**, and/or any type of non-volatile storage device that may store information for use by processor **1520**.

Input component **1540** may include a mechanism that permits an operator to input information to device **1500**, such as a keyboard, a keypad, a button, a switch, etc. Output component **1550** may include a mechanism that outputs information to the operator, such as a display, a speaker, one or more light emitting diodes (LEDs), etc.

Communication interface **1560** may include any transceiver-like mechanism that enables device **1500** to communicate with other devices and/or systems. For example, communication interface **1560** may include an Ethernet interface, an optical interface, a coaxial interface, or the like. Communication interface **1560** may include a wireless communication device, such as an infrared (IR) receiver, a Bluetooth® radio, or the like. The wireless communication device may be coupled to an external device, such as a remote control, a wireless keyboard, a mobile telephone, etc. In some embodiments, device **1500** may include more than one communication interface **1560**. For instance, device **1500** may include an optical interface and an Ethernet interface.

Device **1500** may perform certain operations relating to one or more processes described above. Device **1500** may perform these operations in response to processor **1520** executing software instructions stored in a computer-readable medium, such as memory **1530**. A computer-readable medium may be defined as a non-transitory memory device. A memory device may include space within a single physical memory device or spread across multiple physical memory devices. The software instructions may be read into memory **1530** from another computer-readable medium or from another device. The software instructions stored in memory **1530** may cause processor **1520** to perform processes described herein. Alternatively, hardwired circuitry may be used in place of or in combination with software instructions to implement processes described herein. Thus, implementations described herein are not limited to any specific combination of hardware circuitry and software.

The foregoing description of implementations provides illustration and description, but is not intended to be exhaustive or to limit the possible implementations to the precise form disclosed. Modifications and variations are possible in light of the above disclosure or may be acquired from practice of the implementations. For example, while a series of blocks has been described with regard to one or more figures described herein, the order of the blocks may be modified in other implementations. Further, non-dependent blocks may be performed in parallel.

The actual software code or specialized control hardware used to implement an embodiment is not limiting of the embodiment. Thus, the operation and behavior of the embodiment has been described without reference to the specific software code, it being understood that software and control hardware may be designed based on the description herein.

Even though particular combinations of features are recited in the claims and/or disclosed in the specification, these combinations are not intended to limit the disclosure of the possible implementations. In fact, many of these features may be combined in ways not specifically recited in the claims and/or disclosed in the specification. Although each dependent claim listed below may directly depend on only one other claim, the disclosure of the possible implementations includes each dependent claim in combination with every other claim in the claim set.

Further, while certain connections or devices are shown (e.g., in FIG. **2**), in practice, additional, fewer, or different, connections or devices may be used. Furthermore, while various devices and networks are shown separately, in practice, the functionality of multiple devices may be performed by a single device, or the functionality of one device may be performed by multiple devices. Further, multiple ones of the illustrated networks may be included in a single network, or a particular network may include multiple networks. Further, while some devices are shown as communicating with a network, some such devices may be incorporated, in whole or in part, as a part of the network.

Some implementations are described herein in conjunction with thresholds. The term "greater than" (or simila terms), as used herein to describe a relationship of a value to a threshold may be used interchangeably with the term "greater than or equal to" (or similar terms). Similarly, the term "less than" (or similar terms), as used herein to describe a relationship of a value to a threshold, may be used interchangeably with the term "less than or equal to" (or similar terms), As used herein, "satisfying" a threshold (or similar terms) may be used interchangeably with "being greater than a threshold," "being greater than or equal to a threshold," "being less than a threshold," "being less than or equal to a threshold," or other similar terms, depending on the context in which the threshold is sed.

To the extent the aforementioned implementations collect, store, or employ personal information provided by individuals, it should be understood that such information shall be

used in accordance with all applicable laws concerning protection of personal information. Additionally, the collection, storage, and use of such information may be subject to consent of the individual to such activity, for example, through "opt-in" or "opt-out" processes as may be appropriate for the situation and type of information. Storage and use of personal information may be in an appropriately secure manner reflective of the type of information, for example, through various encryption and anonymization techniques for particularly sensitive information.

No element, act, or instruction used in the present application should be construed as critical or essential unless explicitly described as such. An instance of the use of the term "and," as used herein, does not necessarily preclude the interpretation that the phrase "and/or" was intended in that instance. Similarly, an instance of the use of the term "or," as used herein, does not necessarily preclude the interpretation that the phrase "and/or" was intended in that instance. Also, as used herein, the article "a" is intended to include one or more items, and may be used interchangeably with the phrase "one or more." Where only one item is intended, the terms "one," "single," "only," or similar language is used. Further, the phrase "based on" is intended to mean "based, at least in part, on" unless explicitly stated otherwise.

What is claimed is:

1. A method, comprising:

collecting, by a mobile device, usage data that is indicative of whether a user, of the mobile device, is looking at the mobile device;

determining, by the mobile device, whether the user is driving a vehicle by:

determining whether the user is located in a driver's seat of the vehicle, the determining of whether the user is located in the driver's seat of the vehicle comprising:

collecting first image data of an environment surrounding the user device,

comparing the first image data to second image data that includes one or more images consistent with the user being located in the driver's seat,

communicating with a diagnostics device of the vehicle to determine a distance between the diagnostics device and the mobile device,

comparing the distance to a threshold distance, and

determining, based on the comparing of the first image data to the second image data and the comparing of the distance to the threshold distance, whether the user is located in the driver's seat; and

analyzing, by the mobile device and when it is determined that the user is driving the vehicle, the usage data to determine whether the driver is distracted by the mobile device itself by comparing the usage data to a distraction threshold; and

when it is determined that the driver is distracted by the mobile device while driving the vehicle, disabling, by the mobile device, a feature of the mobile device to prevent the user from being distracted by the mobile device.

2. The method of claim **1**, wherein the usage data comprises at least one of:

information communicated between the mobile device and a network to which the mobile device is connected,

information communicated between the mobile device and the user of the mobile device, or

at least one internal process performed by the mobile device.

3. The method of claim **1**, wherein the usage data comprises an orientation of the mobile device in conjunction with image data collected by the mobile device of the user looking at a display of the mobile device.

4. The method of claim **3**, wherein the orientation of the mobile device is determined by the mobile device based on information from an accelerometer of the mobile device and at least one of:

information from a front-side camera, or

information from a back-side camera of the mobile device.

5. The method of claim **1**, wherein the first image data comprises at least one of:

a seat belt of the vehicle,

a steering wheel of the vehicle;

a feature of a driver console of the vehicle,

a gear shifter of the vehicle,

a center console of the vehicle

a glove compartment of the vehicle,

a rearview mirror of the vehicle,

a back seat of the vehicle,

a front seat of the vehicle,

a window of the vehicle, or

a passenger within the vehicle.

6. The method of claim **1**, wherein:

when the vehicle is not moving for a period of time, determine whether the user is driving, by:

determining whether the user is located in a driver's seat of the vehicle, and

determining whether the vehicle is stopped at a traffic light or in a traffic jam.

7. The method of claim **1**, further comprising:

generating a user profile based on the profile information received from the user and profile information received from an application server, the profile information from the application server comprising profile information corresponding to at least one user that is analogous to the user,

wherein the analyzing of the usage data is based on the user profile.

8. The method of claim **1**, where the analyzing of the usage data to determine whether the driver is distracted by the mobile device comprises determining whether the usage data exceeds a distraction threshold within a pre-selected time interval.

9. The method of claim **1**, further comprising:

defining the distraction threshold based on at least one of:

a user profile associated with the user of the mobile device,

stored information indicating whether the user has a propensity for being distracted by the mobile device while driving,

comparing a time, a duration, or a route, to information identifying a time, duration, or route where the user has been distracted by the mobile device previously,

comparing a time, a duration, or a route, to information identifying a time, duration, or route where an—analogous user has been distracted by another mobile device previously,

a type of media that is being played in the vehicle,

an orientation of the mobile device,

comparing a type of information being communicated, by the mobile device and to a wireless telecommunication network, to another type of information that was previously communicated, by the mobile device

and to the wireless telecommunication network, and that is associated with the user being distracted by the mobile device previously,

comparing a type of information recently received, by the mobile device and from the wireless telecommunication network, to another type of information that was previously received, by the mobile device and from the wireless telecommunication network, and that is associated with the user being distracted by the mobile device,

comparing a type of information recently communicated, by the mobile device and to the user, to another type of information that was previously communicated, by the mobile device and to the user, and that is associated with the user being distracted by the mobile device, or

comparing a type of information recently received, by the mobile device and from the user, to another type of information that was previously received, by the mobile device and from the user, and that is associated with the user being distracted by the mobile device previously.

10. The method of claim **1**, comprising least one of:

communicating the usage data to a diagnostics device of the vehicle,

communicating an instance of distraction to the diagnostics device of the vehicle,

producing an audio signal to notify the user to not use the mobile device while driving,

requesting the vehicle to activate a braking system of the vehicle,

requesting the vehicle to turn off an engine of the vehicle,

requesting the vehicle to activate an automated driving feature of the vehicle,

warning drivers of other vehicles that the user is distracted by the mobile device,

contacting a guardian of the user about the driving being distracted by the mobile device,

contacting an employer of the user about the driving being distracted by the mobile device, or

contacting local law enforcement about the user being distracted by the mobile device.

11. The method of claim **1**, further comprising:

subsequently enabling the disabled feature of the mobile device upon determining that the user is no longer driving the vehicle.

12. A system, comprising:

a mobile device, comprising:

a non-transitory memory device storing:

a plurality of processor-executable instructions; and

a processor configured to execute the processor-executable instructions, wherein executing the processor-executable instructions causes the processor to:

collect usage data that is indicative of whether a user, of the mobile device, is looking at the mobile device,

determine whether the user is driving a vehicle by:

determining whether the user is located in a driver's seat of the vehicle, the determining of whether the user is located in the driver's seat of the vehicle comprising:

collecting first image data of an environment surrounding the user device,

comparing the first image data to second image data that includes one or more images consistent with the user being located in the driver's seat,

communicating with a diagnostics device of the vehicle to determine a distance between the diagnostics device and the mobile device,

comparing the distance to a threshold distance, and

determining, based on the comparing of the first image data to the second image data and the comparing of the distance to the threshold distance, whether the user is located in the driver's seat; and

analyze, when it is determined that the user is driving the vehicle, the usage data to determine whether the driver is distracted by the mobile device itself by comparing the usage data to a distraction threshold, and

when it is determined that the driver is distracted by the mobile device while driving the vehicle, disable a feature of the mobile device to prevent the user from being distracted by the mobile device while driving.

13. The system of claim **12**, wherein executing the processor-executable instructions causes the processor to:

define the distraction threshold based on at least one of:

a user profile associated with the user of the mobile device,

stored information indicating whether the user has a propensity for being distracted by the mobile device while driving,

comparing a time, a duration, or a route, to information identifying a time, duration, or route where the user has been distracted by the mobile device previously,

comparing a time, a duration, or a route, along which the vehicle is moving, to information identifying a time, duration, or route where an analogous user has been distracted by another mobile device previously,

a type of media that is being played in the vehicle,

an orientation of the mobile device,

comparing a type of information being communicated, by the mobile device and to a wireless telecommunication network, to another type of information that was previously communicated, by the mobile device and to the wireless telecommunication network, and that is associated with the user being distracted by the mobile device previously,

comparing a type of information recently received, by the mobile device and from the wireless telecommunication network, to another type of information that was previously received, by the mobile device and from the wireless telecommunication network, and that is associated with the user being distracted by the mobile device,

comparing a type of information recently communicated, by the mobile device and to the user, to another type of information that was previously communicated, by the mobile device and to the user, and that is associated with the user being distracted by the mobile device, or

comparing a type of information recently received, by the mobile device and from the user, to another type of information that was previously received, by the mobile device and from the user, and that is associated with the user being distracted by the mobile device previously.

14. The system of claim **12**, wherein executing the processor-executable instructions causes the processor to perform at least one of the following:

communicate the usage data to a diagnostics device of the vehicle,

communicate an instance of distraction to the diagnostics device of the vehicle,

produce an audio signal to notify the user to not use the mobile device while driving,

request the vehicle to activate a braking system of the vehicle,

request the vehicle to turn off an engine of the vehicle,

request the vehicle to activate an automated driving feature of the vehicle,

warn drivers of other vehicles that the user is distracted by the mobile device while driving,

contact a guardian of the user about the driving while being distracted by the mobile device,

contact an employer of the user about the driving while being distracted by the mobile device, or

contact local law enforcement about the user being distracted by the mobile device.

15. The system of claim **12**, wherein the usage data comprises:

an orientation of the mobile device, and

image data collected by the mobile device of the user looking at a display of the mobile device.

16. The system of claim **15**, wherein the orientation of the mobile device is determined by the mobile device based on information from an accelerometer of the mobile device and at least one of:

information from a front-side camera, or

information from a back-side camera of the mobile device.

17. The system of claim **12**, wherein executing the processor-executable instructions causes the processor to:

when the vehicle is not moving, determine whether the user is driving, by:

determining whether the user is located in a driver's seat of the vehicle, and

determining whether the vehicle is stopped at a traffic light or in a traffic jam.

18. A non-transitory computer-readable medium storing instructions, the instructions comprising:

a plurality of instructions which, when executed by one or more processors associated with a device, cause the one or more processors to:

generate a user profile, the user profile comprising instructions for a mobile device to prevent a user from driving a vehicle while distracted by the mobile device,

collect usage data that is indicative of whether a user, of the mobile device, is looking at the mobile device,

determine whether the user is driving a vehicle by:

determining whether the user is located in a driver's seat of the vehicle, the determining of whether the user is located in the driver's seat of the vehicle comprising:

collecting first image data of an environment surrounding the user device,

comparing the first image data to second image data that includes one or more images consistent with the user being located in the driver's seat,

communicating with a diagnostics device of the vehicle to determine a distance between the diagnostics device and the mobile device,

comparing the distance to a threshold distance, and

determining, based on the comparing of the first image data to the second image data and the comparing of the distance to the threshold distance, whether the user is located in the driver's seat; and

analyze, when it is determined that the user is driving the vehicle, the usage data to determine whether the driver is distracted by the mobile device itself by comparing the usage data to a distraction threshold,

when it is determined that the driver is distracted by the mobile device while driving the vehicle, disable a feature of the mobile device, in accordance with the instructions of the user profile, to prevent the user from being distracted by the mobile device while driving,

monitor movements of the mobile device after disabling the feature of the mobile device, and

enable the disabled feature of the mobile device upon determining that, based on the monitored movements of the mobile device, the user is no longer driving the vehicle.

19. The non-transitory computer-readable medium of claim **18**, wherein the plurality of instructions cause the one or more processors to:

define the distraction threshold based on at least one of:

a user profile associated with the user of the mobile device,

stored information indicating whether the user has a propensity for being distracted by the mobile device while driving,

comparing a time, a duration, or a route, along which the vehicle is moving, to information identifying a time, duration, or route where the user has been distracted by the mobile device previously,

comparing a time, a duration, or a route, along which the vehicle is moving, to information identifying a time, duration, or route where an analogous user has been distracted by another mobile device previously,

a type of media that is being played in the vehicle,

an orientation of the mobile device,

comparing a type of information being communicated, by the mobile device and to a wireless telecommunication network, to another type of information that was previously communicated, by the mobile device and to the wireless telecommunication network, and that is associated with the user being distracted by the mobile device previously,

comparing a type of information recently received, by the mobile device and from the wireless telecommunication network, to another type of information that was previously received, by the mobile device and from the wireless telecommunication network, and that is associated with the user being distracted by the mobile device,

comparing a type of information recently communicated, by the mobile device and to the user, to another type of information that was previously communicated, by the mobile device and to the user, and that is associated with the user being distracted by the mobile device, or

comparing a type of information recently received, by the mobile device and from the user, to another type of information that was previously received, by the mobile device and from the user, and that is associated with the user being distracted by the mobile device previously.

20. The non-transitory computer-readable medium of claim **18**, wherein the plurality of instructions cause the one or more processors to:

communicate the usage data to a diagnostics device of the vehicle,

communicate an instance of distraction to the diagnostics device of the vehicle,

produce an audio signal to notify the user to not use the mobile device while driving,

request the vehicle to activate a braking system of the vehicle,

request with the vehicle to turn off an engine of the vehicle,

request the vehicle to activate an automated driving feature of the vehicle,

warn drivers of other vehicles that the user is distracted by the mobile device while driving,

contact a guardian of the user about the driving while being distracted by the mobile device,

contact an employer of the user about the driving while being distracted by the mobile device, or

contact local law enforcement about the user being distracted by the mobile device.

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