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SYSTEM FOR AUTOMOTIVE DATA MANAGEMENT

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ABSTRACT

Vehicles may include computing devices, referred to as head units, capable of communicating with mobile computing devices carried by users. A mobile computing device may store or otherwise have access to data. For instance, a mobile computing device may store an address. While it may be desirable for a head unit to have access to data, it may be inconvenient for the user to provide data to the head unit or the user may be reluctant to provide data to the head unit. In accordance with the techniques of this disclosure, a mobile computing device may share at least a portion of the data available to the mobile computing device with a head unit of a vehicle when the mobile computing device is near the vehicle. For instance, when a mobile computing device of user X is within a preset distance (e.g., 10 feet) of a vehicle, the mobile computing device may transmit or otherwise provide data to a head unit of the vehicle. When the mobile computing device is no longer near the vehicle, the head unit of the vehicle will delete the data and operate in an anonymous mode. In this way, the head unit of the vehicle may be able to provide an improved experience that takes advantage of data available to a mobile computing device without a user having to provide said data to the head unit.

DESCRIPTION

Interactions with a computing device, such as a head unit of a vehicle, may be improved when the computing device has access to data. However, for various reasons, a user may not want to provide data to the head unit. As one example, it may be more difficult for the user to provide data via the user interface components (e.g., touch screens, buttons, dials, etc.) of the head unit than of another device, such as a mobile computing device (e.g., smartphone, tablet,

etc.). As such, it would be desirable for the head unit of the vehicle to be able to access data at least while the user is operating the vehicle without the user having to use a cumbersome interface to provide said data.

The example system of FIG. 1 below includes a mobile computing device that temporarily provides data to a head unit of a vehicle. Example vehicles in-which the head unit may be located include, but are not limited to, cars, trucks, all-terrain vehicles, snowmobiles, boats, aircraft, farm equipment, construction equipment, or any other vehicle. Example mobile computing devices include, but are not limited to, smart phones, tablet computers, laptop computers, computerized watches, computerized eyewear, computerized gloves, or any other computing device that may store data and be carried by a user. The head unit may be integrated into a dashboard or otherwise located near an operator of the vehicle. In some examples, the head unit may be included in, or may be, a vehicle infotainment system.

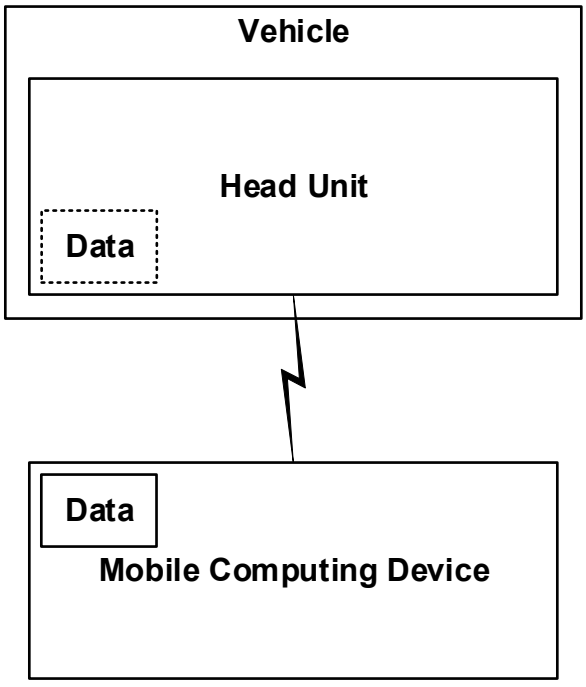

FIG. 1

In general, the mobile computing device may be configured to temporarily provide data to the head unit of the vehicle so as to enable the head unit to perform actions based on the data while the user is operating the vehicle. For instance, responsive to determining that the mobile computing device is connected to the head unit (e.g., via a wired or wireless connection), the mobile computing device may provide the data to the head unit. As discussed in additional detail below, the mobile computing device will only provide the data to the head unit after receiving permission from the user. The head unit may utilize the data to enhance the user's experience while interacting with the head unit. Where the data includes an address, the head unit may, as one example, offer to provide the user with navigational directions to the address.

As discussed above, the data may only be temporarily provided to the head unit (and only after consent is received). For instance, when the mobile computing device becomes disconnected from the head unit, the head unit may automatically delete the provided data. In some examples, the head unit may delete the data immediately after determining that the mobile computing device is disconnected. In some examples, the head unit may implement a timeout period after disconnection of the mobile computing device before deleting the data (e.g., to prevent intermittent disconnections from interfering with the user experience). In some examples, after disconnection during operation of the vehicle to arrive at a destination, the head unit may delete the data when arriving at the destination (e.g., when the vehicle is set to park).

The mobile computing device and the head unit may each run on an operating system. In some examples, an operating system of the mobile computing device and an operating system of the head unit may be compatible (e.g., may be the same operating system and/or be published by a common entity). In such examples, the mobile computing device may be able to execute the temporary provision of the data to the head unit without any, or with minimal, modification. In

other examples, the operating system of the mobile computing device and the operating system of the head unit may not be compatible (e.g., may be different operating systems and/or be published by different entities). In such examples, an additional application, which may be referred to as a companion application, that executes the temporary provision of the data to the head unit may be executed by the mobile computing device.

The mobile computing device may connect to the head unit via any suitable connection, including wired and wireless connections. Example connections include, USB, WI-FI, BLUETOOTH, Ethernet, and any other protocol capable of carrying data between a mobile computing device and a head unit. In some examples, the mobile computing device may automatically connect to the head unit. For instance, after an initial connection session in which the user pairs the mobile computing device with the head unit, the mobile computing device may automatically re-connect with the head unit whenever the head unit is powered on and in range. In some examples, manual user intervention may be required to establish the communication session (and possibly every communication session) between the mobile computing device and the head unit.

As discussed above, when the mobile computing device is connected to the head unit, the mobile computing device may temporarily provide the data to the head unit. In some examples, the mobile computing device may automatically provide the data to the head unit without any contemporaneous user intervention (although prior consent was received). In other examples, the mobile computing device may provide the data to the head unit only after receiving contemporaneous consent. For instance, the mobile computing device may display a graphical user interface that includes a prompt for the user the authorize provision of the user's data to the head unit. Examples of data that may be provided include, but are not limited to, upcoming

events and destinations of the events, names, address data, contact information, calendar entries, preferred language settings, modal preferences, music information (e.g., music preferences), account settings (e.g., social media, music, travelling application accounts, etc.), settings for an automobile (e.g., seat orientation settings, music settings, etc.), color and odor preferences, etc. The user may modify, at any time, which data is to be included in the data provided to the head unit. As discussed above, the computing device may only provide data to the head unit after receiving consent.

While shown above in FIG. 1 as being stored at the mobile computing device, the techniques of this disclosure are equally applicable to scenarios where the data is stored at a remote (e.g., cloud) device. For instance, as opposed to directly providing the data to the head unit, the mobile computing device may cause the remote device to provide the data to the head unit (e.g., via the Internet). Similarly, the mobile computing device may act as a relay to forward the data from the remote device to the head unit.

As discussed above, the head unit may utilize the data to improve the quality of interactions with the head unit. For example, upon receiving such data as preferred seat configurations, navigation-application account login-credentials, and calendar entry information, the head unit may electronically adjust seat configurations to match the preferred seat configurations, submit the navigation application account login credentials to the navigation application, and then display the navigation application within a graphical user interface of the head unit, and/or display the calendar entry information within a calendar application within the graphical user interface of the head unit.