March 08, 2019

Contextual user interface for a smartwatch

Matthew Tait

Contextual user interface for a smartwatch

ABSTRACT

This disclosure describes a context dependent user interface. With user permission and express user content, the context of a smartwatch user is determined and utilized to provide a contextually appropriate user interface. The contextual user interface can include suggestions of commands, apps, controls, etc. that are suitable for the context, e.g., suggestions to look up recipes when the user is in the kitchen near dinner time. The location of the smartwatch is determined by use of wireless fingerprints associated with different locations, obtained with user permission.

KEYWORDS

- smartwatch
- watch complication
- wearable device
- contextual user interface
- smart suggestions
- WiFi fingerprint

BACKGROUND

Smartwatches commonly include features that enable control of other devices and are also used as an information source. Given the relatively limited surface area of a smartwatch, contextual configuration of the user interface based on a current context of a user can enhance user experience.

DESCRIPTION

This disclosure describes a context dependent user interface for a smartwatch. With user permission and express user content, the context of use of a smartwatch, e.g., location, time, etc. is determined. The determined context is utilized to provide a contextual user interface. The user interface is configured to provide easy access for users to retrieve information and other functionality based on the context.

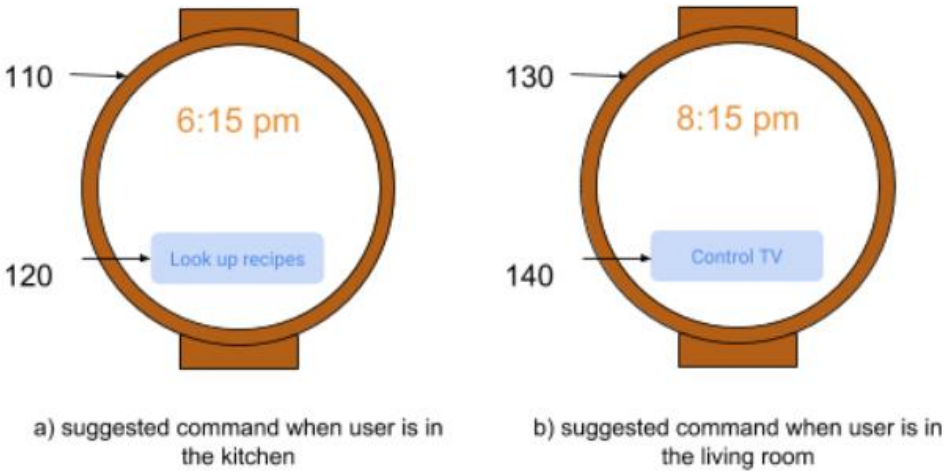

Fig. 1: Contextual adjustment of a smartwatch user interface

Fig. 1 illustrates examples of context-based configuration of a smartwatch user interface. In Fig. 1(a), it is determined that a smartwatch (110) is being worn while the user is located in the kitchen. Based on the location and the time of day (6.15pm), a suggested command “Look up recipes” (120) is displayed on the smartwatch screen that enables the user to easily navigate to access recipes. In Fig. 1(b), it is determined that the smartwatch (130) is in use while the user is in the living room later during the evening. Based on the user context, a “Control TV” command (140) is displayed on the smartwatch screen that enables the user to control the television using their smartwatch.

As illustrated in the examples above, with user permission and express consent, contextual information about the user can be utilized to provide the user with smartwatch controls for suitable user devices. For example, television controls can be displayed on the smartwatch screen when the user steps into a room with a television, e.g., a living room, a lounge, etc. In another example, when the user is detected to have stepped into a certain room, controls for lights to the room can be displayed. Navigation controls to relevant contextual information can be provided to the users. For example, links to recipes can be provided in the kitchen; weather and commute information can be provided when a user steps outside their front door; etc. On-device actions can also be provided based on the user context. For example, an alarm application may be emphasized in a bedroom; a timer application may be emphasized in the kitchen; etc.

The contextual suggestions can be provided using a variety of interfaces. For example, the suggestions can be provided as sound or haptic notifications on the smartwatch; displayed on the smartwatch face; as watch complications; via an audio user interface; within smartwatch applications utilized by the user; etc. While the foregoing description refers to smartwatches, the context-based user interface techniques can be used for any portable device, e.g., a fitness tracker, headphones, smartphones, other wearable sensors, etc.

Location determination

With user permission, determination of the location of the smartwatch is performed by use of user-facilitated signal-based fingerprints for different locations. For example, a smartwatch user can tag various locations, e.g., by selecting from options such as “living room,” “kitchen,” “game room,” etc. For each location, a scan of proximate WiFi access points is performed. The scan includes searching for proximate WiFi access points and recording the

name (e.g., BSSID), signal strength, and round trip time (RTT) associated with each access point. Several scans can be performed over a period of a few seconds to create a fingerprint for each location selected by the user.

Subsequent to the creation of the fingerprints, with user permission and express consent, the location context is estimated by performing a WiFi scan to obtain access point names, signal strengths and RTT at a current location. The obtained information is compared to the stored fingerprint information to determine the user location. For example, the location can be determined using machine learning, by computing the average difference between the stored signal values and the current signal values, etc. Other data sources such as Bluetooth beacons, ultrasonic signals from televisions, accelerometers, gyroscopes, etc. can also be used to determine the location, if permitted by the user. Use of multiple data sources can improve the accuracy of the determined location.

Further to the descriptions above, a user may be provided with controls allowing the user to make an election as to both if and when systems, programs or features described herein may enable collection of user information (e.g., information about a user's social network, social actions or activities, profession, a user's preferences, or a user's current location), and if the user is sent content or communications from a server. In addition, certain data may be treated in one or more ways before it is stored or used, so that personally identifiable information is removed. For example, a user's identity may be treated so that no personally identifiable information can be determined for the user, or a user's geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level), so that a particular location of a user cannot be determined. Thus, the user may have control

over what information is collected about the user, how that information is used, and what information is provided to the user.

CONCLUSION

This disclosure describes a context dependent user interface. With user permission and express user content, the context of a smartwatch user is determined and utilized to provide a contextually appropriate user interface. The contextual user interface can include suggestions of commands, apps, controls, etc. that are suitable for the context, e.g., suggestions to look up recipes when the user is in the kitchen near dinner time. The location of the smartwatch is determined by use of wireless fingerprints associated with different locations, obtained with user permission.