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Virtual Assistant That Selectively Announces Device Notifications

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ABSTRACT

Users receive notifications for various events, e.g., incoming messages, device alerts, notifications from apps, etc. Currently, to avoid being inundated with notifications, users need to review and dismiss each notification, turn off certain notifications, or turn on a do-not-disturb mode of their device. This disclosure describes an intelligent virtual assistant that utilizes machine learning techniques to automatically determine whether a particular notification is important at any given moment. Based on the determined importance level, the virtual assistant can either proactively announce the notification, delay the notification announcement, or silence the notification.

KEYWORDS

- Virtual assistant
- Notifications
- Message alerts
- Smart speaker
- Smart display
- Machine learning

BACKGROUND

Users of devices such as smartphones, tablets, wearable devices, computers, etc. receive notifications for various events, e.g., incoming email or chat messages, device alerts, notifications from apps, etc. It is often the case that the user receives a very large number of notifications. Currently, to avoid being inundated with notifications, users need to review and

dismiss each notification, turn off certain notifications (e.g., from certain apps; for certain events; etc.) or turn on a do-not-disturb mode of their device.

DESCRIPTION

This disclosure describes an intelligent virtual assistant that can automatically determine whether a particular notification is important at any given moment. Based on the determined importance level, the virtual assistant can either proactively announce the notification (e.g., notify the user via an audible alert, vibration, and/or on-screen update), delay the notification announcement, or silence the notification.

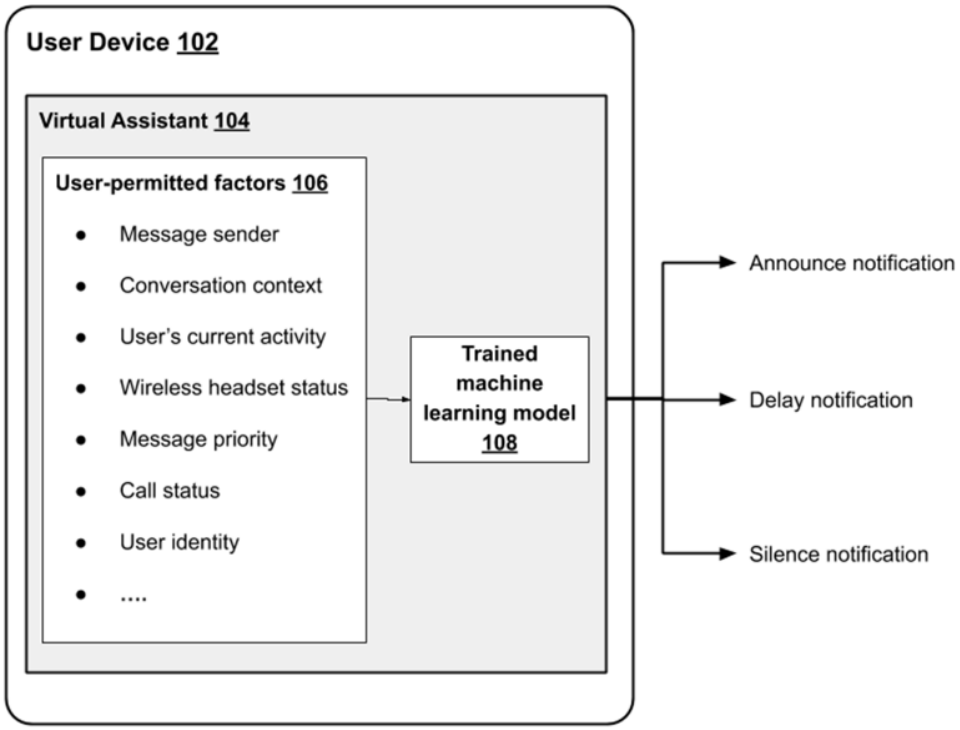

Fig. 1: Selective notification announcement by virtual assistant

Fig. 1 illustrates a user device (102) on which a virtual assistant (104) is provided that implements the techniques described herein. The virtual assistant can utilize various user-permitted factors (106) in determining the importance of a notification. Such factors can

include, e.g., for an incoming message notification - the sender of the message, whether the message is part of an active conversation, the type of activity that the user is engaged in (e.g., cooking, driving, etc.), whether the user is utilizing a wireless headset, whether the message is marked urgent or has important content, whether the user is currently engaged in a call (e.g., a phone call, a video call, etc.). The various factors are provided to a trained machine learning model (108) that provides as output the determined importance level for the notification.

Based on the user activity status, e.g., driving, on a phone/video call, cooking, etc. and the importance level of the message, the virtual assistant determines whether to announce the notification or to delay the announcement of the notification until the user is available (e.g., after the call, once the user is detected to not be driving, etc.) When the virtual assistant is a smart display that includes a camera, it can detect the user's presence (if permitted by the user) and determine which notifications to announce. For example, the virtual assistant may announce the user's messages only if the user's presence is detected, but continue to announce general alerts, e.g., weather alerts, when a different person is detected.

The machine learning model may be trained using federated learning. If permitted by the user, training may be performed based on the user's prior behavior, e.g., typically dismisses weather alerts when on calls; always replies to messages from Aisha; listens to traffic alerts when driving; etc.

While the foregoing refers to notifications, the virtual assistant can also provide help regarding actions to be performed with respect to received notifications. For example, if the user receives a message from a friend stating "Hey - Joe's Coffee was closed. We're meeting at Kaylee's Cafe instead" - the virtual assistant can offer to provide navigation directions to the

updated location (Kaylee's cafe), based on the notification. In another example, the virtual assistant can also suggest replies or actions for received notifications.

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 notifications, prior actions performed on notifications, 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 an intelligent virtual assistant that utilizes machine learning techniques to automatically determine whether a particular notification is important at any given moment. Based on the determined importance level, the virtual assistant can either proactively announce the notification, delay the notification announcement, or silence the notification.

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