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Automatically Changing Accessibility Settings on an Electronic Device Responsive to Detecting the Presence of a Hearing Device

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Automatically Changing Accessibility Settings on an Electronic Device Responsive to Detecting the Presence of a Hearing Device

Abstract:

This publication describes techniques and procedures for automatically changing accessibility settings on an electronic device responsive to detecting the presence of a hearing device. For example, detecting a hearing device connected to an electronic device and then performing one or more actions to enhance accessibility services. The actions may include providing a prompt to the user to suggest using different accessibility settings or automatically toggling to a user's hearing device-dependent accessibility settings. The hearing device-dependent settings may turn on audio enhancement features of the electronic device, such as a screen reader application (screen reader) and speech-to-text functionality. The hearing device-dependent settings may decrease the use of visibility enhancement settings such as large font and captions. The electronic device can quickly toggle between the current settings to the hearing device-dependent settings when the hearing device is detected or removed.

Keywords:

Hearing aid, hearing loss, hearing device, headphones, headset, earphone, Bluetooth, screen reader, accessibility settings, accessibility profile, font, speech-to-text, transcription, peripheral device

Background:

For a user who desires to use a screen reader application (screen reader) to interact with an electronic device (*e.g.*, smartphone), it can be difficult to switch between the screen reader and other accessibility functionality/settings. The screen reader allows the user to interact with the electronic device through audio guidance and special controls that enable the user to navigate without needing to see the screen. To enable a screen reader, the user must navigate menus to find accessibility settings on the electronic device in order to turn on the screen reader for use with a peripheral device, such as a hearing device (*e.g.*, hearing aids, headphones, headset, etc.). The hearing device may be connected to the electronic device via a wired (*e.g.*, audio jack, USB) or wireless connection (*e.g.*, Bluetooth). As an example, for a user with presbyopia and hearing loss, the user may prefer to disable large font display on the electronic device and instead use a screen reader when hearing aids are connected, because the large font can make websites and applications more difficult to navigate. In another example, for a user with typical hearing but with difficulty reading (*e.g.*, dyslexia, visual field cut, etc.), the user may prefer assistance from a screen reader when a hearing device (*e.g.*, headphones, earphone, headset, etc.) is connected to the electronic device. In both examples, navigation to turn on the screen reader when a hearing device is connected is time-consuming and potentially frustrating for the user.

Therefore, a comprehensive solution that changes accessibility settings based on whether a hearing device is connected to the electronic device is desirable.

Description:

This publication describes techniques and procedures for automatically changing accessibility settings on an electronic device responsive to detecting the presence of a hearing

device. For example, detecting a hearing device connected to an electronic device, such as a smartphone, and then performing one or more actions to enhance accessibility services. The actions may include providing a prompt to the user to suggest using different accessibility settings and/or automatically changing accessibility settings to the user's preferred hearing device-dependent accessibility settings. The electronic device can quickly toggle between different user accessibility settings when a connection to the hearing device is detected, or the hearing device is disconnected.

Figure 1 illustrates an example electronic device and elements of the electronic device that support utilizing hearing device detection to enhance accessibility services.
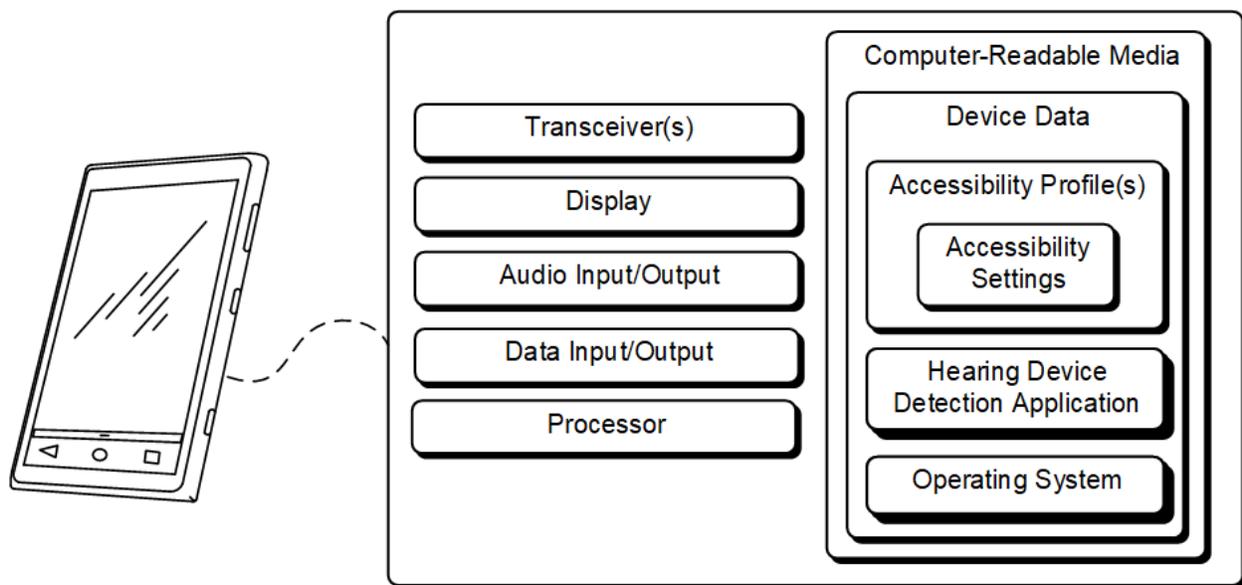

Figure 1

As illustrated in Figure 1, the electronic device is a smartphone. However, other electronic devices (*e.g.*, a tablet, a computer, a wireless-communication device) can also support the techniques and procedures described in this publication. The electronic device includes transceiver(s) for transmitting data to and receiving data from nearby devices, a display (*e.g.*, a light-emitting diode (LED) display, a liquid crystal display (LCD)), an audio input/output

mechanism (*e.g.*, a microphone, a speaker), and a data input/output mechanism (*e.g.*, audio jack, USB, etc.). The electronic device also includes a processor and a computer-readable medium (CRM) that contains executable instructions for implementing the techniques and procedures described in this publication. CRM includes device data. The device data includes user data including one or more accessibility profiles with one or more accessibility settings, multimedia data, applications installed on the device (*e.g.*, a hearing device detection application), and/or an operating system of the electronic device. Accessibility settings may include a screen reader application, speech-to-text functionality, text-to-speech functionality, captions, font size, and other settings that allow a user with a hearing, visual, or tactile impairment to use the electronic device.

The device data includes executable instructions of a hearing device detection application that can be executed by the processor(s). The hearing device detection application represents functionality that detects a hearing device connected to the electronic device (*e.g.*, a local wireless connection, a wired connection via an audio jack) and either prompts a user to change settings to hearing device-dependent settings or automatically changes accessibility settings of the device to hearing device-dependent settings. The hearing device detection application may automatically switch the electronic device back to the original accessibility settings when the hearing device is no longer detected (*e.g.*, hearing device disconnected by the user, out of range, out of battery, etc.).

Figure 2, below, illustrates an electronic device that detects a connection to a hearing device and prompts a user to turn on hearing device-dependent settings to improve the user experience with the hearing device.
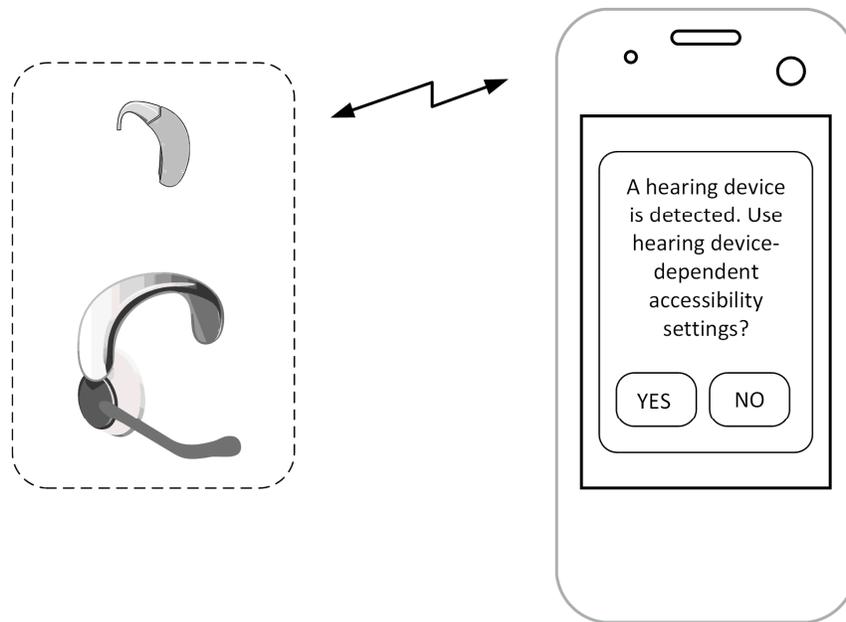
Figure 2

In the case illustrated in Figure 2, the smartphone detects a hearing device via a wireless connection. While wireless hearing devices of a hearing aid and a headset are illustrated in Figure 2, the hearing device can also be plugged into the smartphone and be detected. In the case illustrated in Figure 2, the user is prompted to turn on hearing device-dependent accessibility settings. The user can utilize an accessibility profile on the electronic device to set the user's hearing device-dependent accessibility settings.

A user may customize an accessibility profile with a connected hearing device to be different from an accessibility profile without a connected hearing device. As an example, the user's hearing device-dependent accessibility profile may have accessibility settings with the options of: turned off large font display, turned off captions display during videos, enabled a screen reader, and/or enabled text-to-speech functionality. The accessibility settings may include an option to prompt a user to automatically toggle to the hearing device-dependent accessibility settings when a hearing device is detected.

In another embodiment, the hearing device-dependent accessibility profile may be created by the electronic device utilizing machine-learning to learn a user's preferences. In this embodiment, the user benefits from a seamless user experience when a hearing device is detected without explicitly having to set the accessibility settings.

Further to the above descriptions, a user may be provided with controls allowing the user to make an election as to both if and when systems, applications, and/or features described herein may enable collection of user information (*e.g.*, information about a user's computing device, information about peripheral devices used by a user, information about peripheral devices the user's computing device has connected to, a user's preferences, a user's current location), and if the user is sent content and/or communications from a server. In addition, certain data may be treated in one or more ways before it is stored and/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. In another example, 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.

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