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March 07, 2016

INVISIBLE USER CONTROLS FOR SUPPORTING VISUALLY DISABLED USERS

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Recommended Citation

Levin, Noah; Macneil, Drew; and Manchanda, Alok, "INVISIBLE USER CONTROLS FOR SUPPORTING VISUALLY DISABLED USERS", Technical Disclosure Commons, (March 07, 2016)
http://www.tdcommons.org/dpubs_series/176



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INVISIBLE USER CONTROLS FOR SUPPORTING VISUALLY DISABLED USERS

ABSTRACT

A system and method are disclosed that augment a user interface with invisible elements that enable a visually disabled user to exercise functionality that is hard to discover without visual cues. The method exposes the functionality to a visually disabled user by adding an invisible UI element in a way that does not affect a sighted user's interaction with the application. For mobile devices that have accessibility service activated, the mechanism works by adding invisible buttons to the recent viewed stack or carousel of screens to access the "Recently Viewed" panes, in one example. The buttons or other invisible elements are configured such that the accessibility system can still find them, thereby enabling the visually disabled user to activate their functionality.

BACKGROUND

Modern mobile user interfaces (UIs) increasingly rely on visual cues and gestures to be fully functional. Nevertheless these interactions are not easily discoverable for visually disabled users. A popular mobile application uses a stack of panes to denote a user's different activities and sessions. Each new activity such as a search or loading a web page begins on a new pane that slides in over the current one. A pane may subsequently be dismissed to return to a position 'beneath' the current one, allowing the user to easily return to their previous activity by accessing the panes below, as required. Since many panes may accumulate, the application also offers the ability to look at the entire pane stack at once, as shown in FIG. 1. It allows a user to scroll through open panes and return to any of them as required. The pane-stack method of screen presentation is easy to understand and navigates intuitively for sighted people. However, for a

visually-impaired user using accessibility services involving text to speech or haptic feedback, such a stack could be difficult to use.

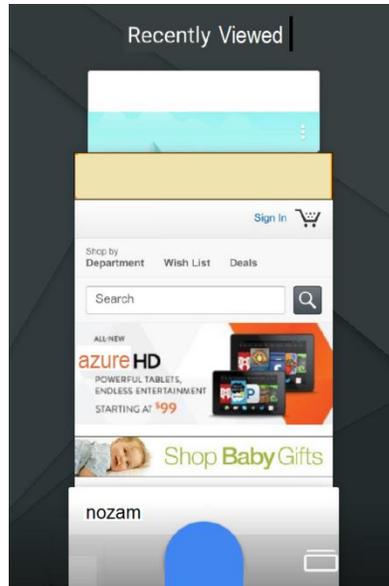


FIG. 1: Screen grab of a stack of recently viewed panes

DESCRIPTION

A system and method are disclosed that augment at least one visible cue with an invisible element exposed solely to a mobile phone's accessibility system for enabling visually disabled users to exercise functionalities that are hard to discover without visual cues. In one example, the method exposes the 'Recently Viewed' functionality to a visually disabled user by adding an invisible UI element in a way that does not affect the interaction of sighted users with the application.

For mobile devices that have an accessibility service activated, the mechanism may work by adding two invisible buttons to the recent viewed stack or carousel of screens. One possible positional layout for these invisible buttons is outlined in yellow in FIG. 2. Although these

buttons cannot be seen visually, they are constructed such that the accessibility system can still find them, and thus the visually disabled user can activate their functionality. One button will be used to move the carousel back by one pane, and the other will move the carousel forward by one pane. The accessibility system will then focus on the topmost pane and read its title. Once the accessibility system has read the title of the topmost pane, the user selects the pane if he/she intends to read the same. This will cause the pane to become full screen, and be active.

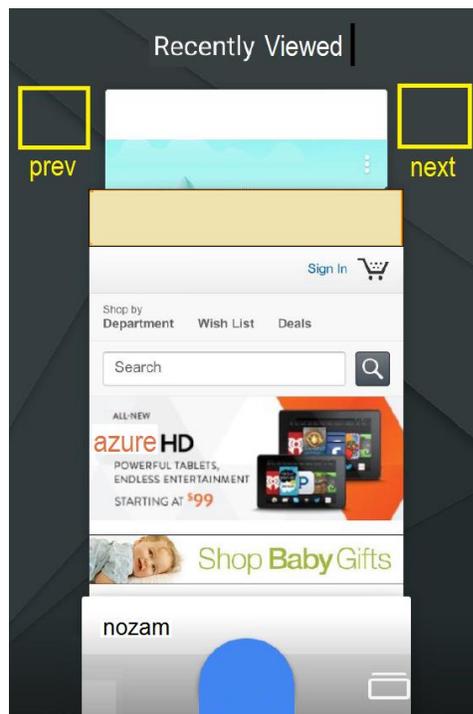


FIG. 2: A stack of panes with invisible UI elements accessible to a disabled user

The UI element is invisible to the eye but is completely visible to the accessibility system of the mobile device so that the device interprets it as a normal button that can be activated. Alternatively, the user can also use swipe up/down gesture of the accessibility system to cycle through the pane carousel. This allows the user to navigate through the pane stack much more

quickly than with the button. However this gesture is not as discoverable, so both mechanisms for navigating the pane stack could be made available to the user.

The disclosed system and method alters the functionality specifically for a visually disabled user using an accessibility service (such as text-to-speech or haptic feedback) for easier navigation and scrolling through recently used panes. This provides a wide range of experiences for both sighted and visually disabled users. For example, designers could rely on gestures and slight visual cues to design intuitive interactions without worrying about whether these interactions are easily accessible, since the same interactions can be exposed to visually disabled users via the invisible UI elements.