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INTERACTION WITH EXPANDABLE WIDGETS

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ABSTRACT

A computing device (e.g., a smartphone, a laptop computer, a tablet computer, a smartwatch, etc.) may enable a widget (e.g., application, program, etc.) to transition between a minimized (e.g., collapsed, smaller, etc.) state and a maximized (e.g., expanded, larger, etc.) state in response to user input (e.g., a tap, a long press, etc.). A minimized widget and a maximized widget may differ in various respects. For instance, the minimized widget may occupy less space on a display of the computing device than the maximized widget. Additionally or alternatively, the maximized widget may perform a greater variety of actions than the minimized widget. For example, the minimized widget may not perform actions associated with gestures that conflict with (e.g., gestures that are similar, if not substantially similar to) home screen gestures (e.g., swiping left and/or right to change screens, swiping up and/or down to display device settings, etc.) to avoid interfering with the actions associated with the home screen gestures, but the maximized widget may perform the actions associated with such gestures (e.g., to perform a scrolling action, a search action, an edit action, a delete item action, etc.). Accordingly, a user may perform a maximization gesture to maximize a minimized widget and access additional, and in some cases more complex, functionality of the widget.

DESCRIPTION

FIG. 1 below is a conceptual diagram illustrating a computing device 100 that uses a graphical user interface module 102 (“GUI module 102”) to cause one or more widgets 110 to transition between a minimized state and a maximized state in response to user input. As shown in FIG. 1, computing device 100 may include a presence-sensitive display 104, one or more

processors 106, and one or more storage devices 108. Storage devices 108 may include GUI module 102 and widgets 110.

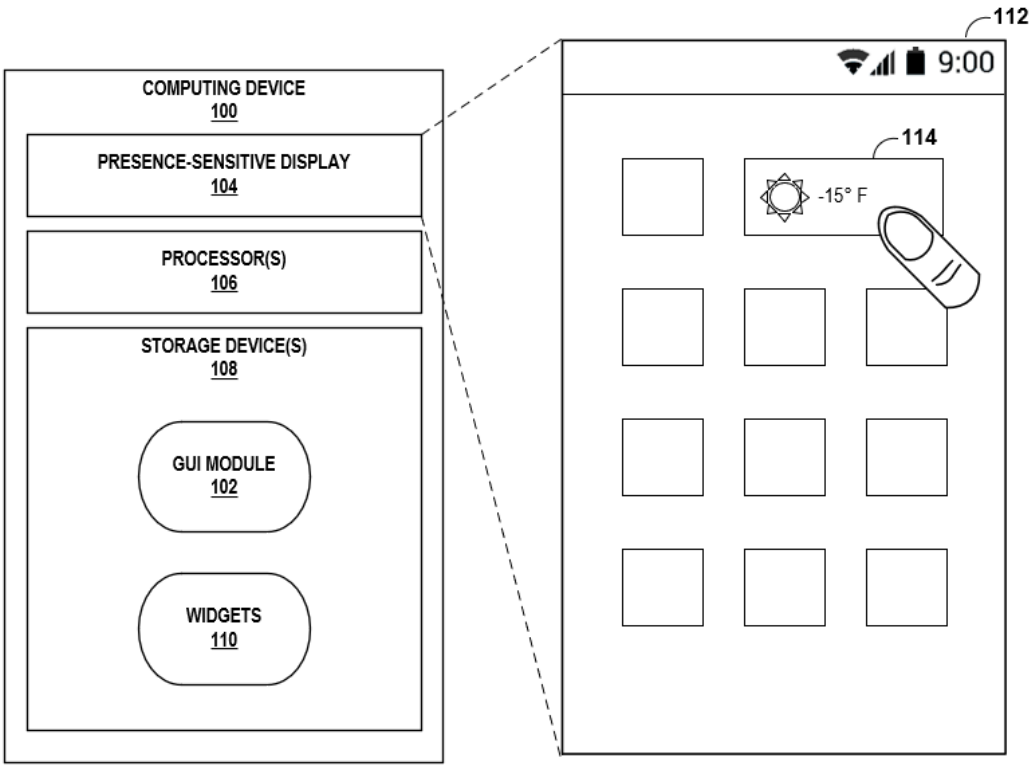

FIG. 1

As shown in FIG. 1, computing device 100 may include presence-sensitive display 104, processors 106, and storage devices 108. Computing device 100 may be any mobile or non-mobile computing device, such as a cellular phone, a smartphone, a desktop computer, a laptop computer, a tablet computer, a portable gaming device, a portable media player, an e-book reader, a watch (including a so-called smartwatch), a gaming controller, and/or the like.

Presence-sensitive display 104 of computing device 100 may be a presence-sensitive display that functions as an input device and as an output device. For example, presence-sensitive display 104 may function as an input device using a presence-sensitive input component, such as a resistive touchscreen, a surface acoustic wave touchscreen, a capacitive

touchscreen, a projective capacitance touchscreen, a pressure sensitive screen, an acoustic pulse recognition touchscreen, or another presence-sensitive display technology. Additionally, presence-sensitive display 104 may function as an output (e.g., display) device using any of one or more display components, such as a liquid crystal display (LCD), dot matrix display, light emitting diode (LED) display, microLED display, organic light-emitting diode (OLED) display, e-ink, active matrix organic light-emitting diode (AMOLED) display, or similar monochrome or color display capable of outputting visible information to a user of computing device 100.

Processors 106 may implement functionality and/or execute instructions associated with computing device 100. Examples of processors 106 may include one or more of an application specific integrated circuit (ASIC), a field programmable gate array (FPGA), an application processor, a display controller, an auxiliary processor, a central processing unit (CPU), a graphics processing unit (GPU), one or more sensor hubs, and any other hardware configure to function as a processor, a processing unit, or a processing device. GUI module 102 and widgets 110 may be operable by processors 106 to perform various actions, operations, or functions of computing device 100.

Storage devices 108 may include one or more computer-readable storage media. For example, storage devices 108 may be configured for long-term, as well as short-term storage of information, such as instructions, data, or other information used by computing device 100. In some examples, storage devices 108 may include non-volatile storage elements. Examples of such non-volatile storage elements include magnetic hard discs, optical discs, solid state discs, and/or the like. In other examples, in place of, or in addition to the non-volatile storage elements, storage devices 108 may include one or more so-called “temporary” memory devices, meaning that a primary purpose of these devices may not be long-term data storage. For example, the

devices may comprise volatile memory devices, meaning that the devices may not maintain stored contents when the devices are not receiving power. Examples of volatile memory devices include random access memories (RAM), dynamic random access memories (DRAM), static random access memories (SRAM), etc.

Computing device 100 may display a graphical user interface 112 ("GUI 112") including one or more widgets 110 to a user. Widgets 110 may include information such as the time, temperature, calendar events, sensor data, messaging information, mapping information, photos, news, application suggestions, notes, music information, podcast information, social network information, etc., and may perform various actions in response to various gestures (e.g., perform a scrolling action, a search action, an edit action, a delete item action, etc.). In general, widgets 110 may have different fixed (e.g., constant, static, etc.) sizes that, in some examples, provide different amounts of information. While a user of computing device 100 may manually control the size of widgets 110 (e.g., by touching and dragging a corner of widgets 110 and, optionally, repositioning widgets 110), the size of widgets 110 may be fixed such that the user may need to repeat the entire process to readjust the size of widget. In other words, the size of widgets 110 may not dynamically increase and decrease in size in response to more concise user inputs, such as a tap, a long press, etc.

In accordance with techniques of this disclosure, computing device 100 may enable widgets 110 to transition between a minimized state 114 ("minimized widget 114") and an expanded state 116 ("maximized widget 116") in response to user input (e.g., a tap, a long press, etc.). Minimized widget 114 is shown in FIG. 1, and maximized widget 116 is shown in FIG. 2 below. Minimized widget 114 and maximized widget 116 may differ in various respects. For instance, minimized widget 114 may occupy a predetermined amount of space on display 104

that is less than a predetermined amount of space on display 104 that maximized widget 116 occupies. Additionally or alternatively, maximized widget 116 may include additional information and perform more actions (e.g., associated with more gestures) than minimized widget 114.

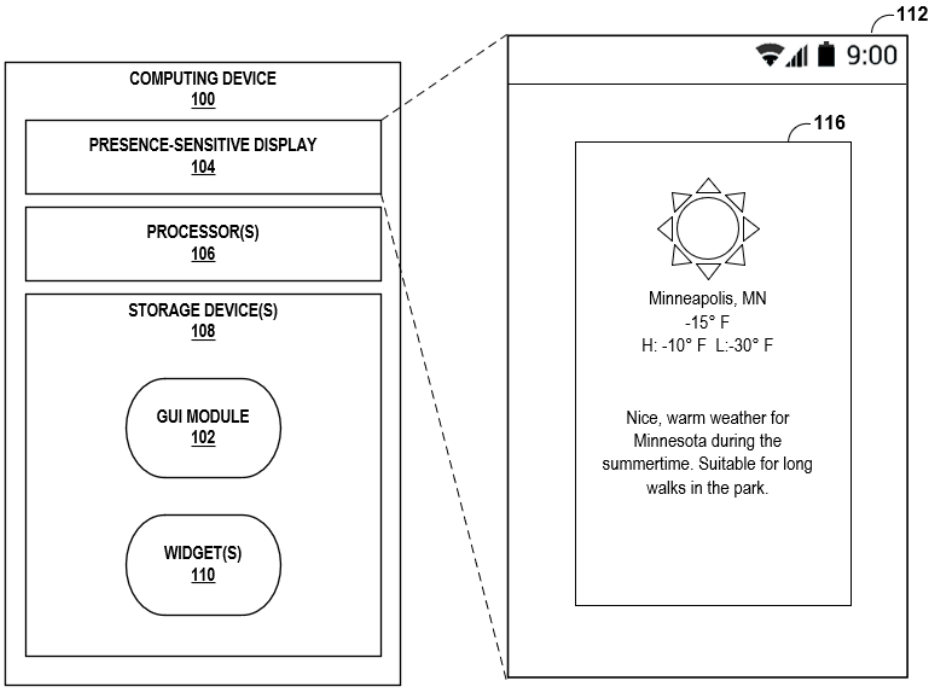

FIG. 2

A user of computing device 100 may provide a minimization user input, such as a tap, long press, and/or the like, to cause maximized widget 116 to transition into minimized widget 114. Minimized widget 114 may have a smaller size (e.g., relative to maximized widget 116) suitable for providing limited information and/or performing a limited set of functions (e.g., the time, temperature, a count of unread messages in the user's inbox, etc.). Minimized widget 114 may perform a limited set of actions (e.g., transitioning into maximized widget 116) but not perform actions associated with gestures that conflict with (e.g., gestures that are similar, if not substantially similar to) home screen gestures (e.g., swiping left and/or right to change screens,

swiping up and/or down to display device settings, etc.) to avoid interfering with the actions associated with the home screen gestures.

For example, if a user swipes right on presence-sensitive display 104 (i.e., a home screen gesture) when widgets 110 are in minimized state 114, computing device 100 may perform the navigation action of changing the screen of computing device 100. As such, minimized widget 114 may not respond to home screen gestures to avoid interfering with the actions associated with the home screen gestures. In this way, minimized widget 114 may still provide limited utility to the user while occupying less space on display 104 and without interfering with other functions (e.g., performing navigation, displaying settings, etc.) of computing device 100.

A user of computing device 100 may provide a maximization user input, such as a tap, long press, and/or the like, to cause minimized widget 114 to transition into maximized widget 116. Maximized widget 116 may have a larger size (e.g., relative to minimized widget 114) suitable for providing more information (e.g., a description of the weather, a scrollable list of items, etc.) and/or performing a larger set of functions (e.g., a scrolling action, a search action, an edit action, a delete item action, etc.). In some examples, the additional functions that maximized widget 116 can perform may include functions associated with gestures that conflict with home screen gestures.

For example, if a user swipes right on presence-sensitive display 104 when widgets 110 are in maximized state 116, computing device 100 may perform an action specific to maximized widget 116. For example, if maximized widget 116 is a mail application, swiping right on an email may cause computing device 100 to delete the email instead of performing the navigation action of changing the screen of computing device 100. In this way, maximized widget 116 may provide greater utility to the user by including a greater amount of information and performing a

greater number (and sometimes more complex) functions, even if one or more of the gestures associated with these functions conflict with home screen gestures.

In some examples, GUI module 102 may animate the transition between minimized widget 114 and maximized widget 116. For example, responsive to a maximization user input, such as tapping any portion of minimized widget 114, minimized widget 114 may substantially continuously increase in size and reach the size of maximized widget 116. Similarly, responsive to a minimization user input, such as tapping on presence-sensitive display 104 at a location outside of maximized widget 116, maximized widget 116 may substantially continuously decrease in size and reach the size of minimized widget 114. The centroid of widgets 110 may move during the transition (and the animation thereof) such that the location of the centroid of minimized widget 114 may not be the same as the location of the centroid of maximized widget 116.

One or more advantages of the techniques described in this disclosure include providing a user quick access to information and actions in the form of a minimized widget without fully opening (e.g., expanding) the widget. Another advantage includes reducing the space a widget occupies on the display when the user is not actively engaged with the widget while still providing quick access to information and action. Then, when the user wants to access additional information and actions, the user may provide a concise user input to cause the minimized widget to transition into the maximized widget that supports a greater variety of interaction.

It is noted that the techniques of this disclosure may be combined with any other suitable technique or combination of techniques. As one example, the techniques of this disclosure may be combined with the techniques described in U.S. Patent Application Publication No. US20090125835A1. In another example, the techniques of this disclosure may be combined

with the techniques described in U.S. Patent Application Publication No. US20200348822A1. In yet another example, the techniques of this disclosure may be combined with the techniques described in U.S. Patent Application Publication No. US20140310643A1. In yet another example, the techniques of this disclosure may be combined with the techniques described in U.S. Patent Application Publication No. US20090260022A1.