

KEYBOARDS FOR PORTABLE ELECTRONIC DEVICES

RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Patent Application No. 60/756,890, filed Jan. 5, 2006, entitled "Keyboards for Portable Electronic Devices," which application is incorporated by reference herein in its entirety.

[0002] This application is related to U.S. patent application Ser. No. to be assigned, filed Jul. ____, 2006, entitled "Touch Screen Keyboards for Portable Electronic Devices," Attorney Docket No. 63266-5052-US, which application is incorporated by reference herein in its entirety.

[0003] This application is related to U.S. patent application Ser. No. 11/228,700, filed Sep. 16, 2005, entitled "Operation of a Computer with Touch Screen Interface," which application is incorporated by reference herein in its entirety.

TECHNICAL FIELD

[0004] The disclosed embodiments relate to user interfaces, and in particular, to user interfaces that include a touch screen keyboard.

BACKGROUND

[0005] As portable devices become more compact, and the amount of information to be processed and stored increases, it has become a significant challenge to design a user interface that allows users to easily interact with the device. This is unfortunate since the user interface is the gateway through which users receive not only content but also responses to user actions or behaviors, including user attempts to access a device's features or tools. Some portable electronic devices (e.g., mobile phones) have resorted to adding more pushbuttons, increasing a density of push buttons, overloading the functions of pushbuttons, or using complex menu systems to allow a user to access, store and manipulate data. These conventional user interfaces often result in complicated key sequences and menu hierarchies that must be memorized by the user. In addition, as the number of pushbuttons has increased the proximity of neighboring buttons often makes it difficult for users to activate a desired pushbutton.

[0006] Many conventional user interfaces, such as those that include physical pushbuttons, are also inflexible. This is unfortunate since it may prevent a user interface from being configured and/or adapted by either an application running on the portable device or by users. When coupled with the time consuming requirement to memorize multiple key sequences and menu hierarchies, and the difficulty in activating a desired pushbutton, such inflexibility is frustrating to most users.

[0007] Accordingly, there is a need for more transparent and intuitive user interfaces for portable electronic devices that are easy to use, configure, and/or adapt.

SUMMARY OF EMBODIMENTS

[0008] The above deficiencies and other problems associated with user interfaces for portable devices are reduced or eliminated by the disclosed touch screen keyboards and their methods of use.

[0009] In some embodiments, a method includes displaying a plurality of icons on a touch-sensitive display. A respective icon in at least a subset of the plurality of icons corresponds to two or more symbols. A contact by a user with the touch-sensitive display that corresponds to the respective icon is detected. A respective symbol in the two or more symbols to which the contact further corresponds is determined. The displayed respective icon is modified to indicate that the contact corresponds to the respective symbol.

[0010] The respective symbol may be selected when the user breaks contact with the respective icon. The respective symbol may be capitalized when contact is maintained for a time interval exceeding a pre-determined value.

[0011] Modifying may include changing a shape of the respective icon. Changing the shape may include an asymmetric distortion of the shape. An initial shape of the respective icon may include an arc.

[0012] Detecting may include detecting rolling of a finger over a region that corresponds to the respective symbol. The contact may include a gesture that is selected from the group consisting of one or more taps, a swipe and a rolling of a finger.

[0013] The two or more symbols for the respective icon may be determined in accordance with a lexicography model. The lexicography model may correspond to a user usage history. The user usage history may occur prior to the establishment of the contact. The lexicography model may correspond to a frequency of usage of symbols in a language.

[0014] In some embodiments, the respective symbol is displayed in a region within the shape of the respective icon and outside of a region corresponding to the contact.

[0015] In some embodiments, a visual indicator corresponding to the respective symbol is provided. The visual indicator may include visual illumination proximate to the respective icon. The visual illumination may include a band around at least a portion of the respective icon. The visual indicator may be in accordance with a user usage history that occurs prior to the detecting of the contact.

[0016] In some embodiments, a method includes displaying a plurality of icons on a touch-sensitive display. Two or more subsets of the plurality of icons are arranged in corresponding rows on the touch-sensitive display. A space greater than a pre-determined value is included between adjacent rows. A contact by a user with the touch-sensitive display that corresponds to a respective icon is detected. A symbol corresponding to the respective icon is displayed in the space between a respective row corresponding to the respective icon and a neighboring row while the contact is maintained.

[0017] The symbol may be the respective icon. The symbol may be magnified relative to the respective icon. The neighboring row may be above the respective row.

[0018] In another embodiment, a plurality of icons are displayed on a touch-sensitive display. A contact by a user with the touch-sensitive display that corresponds to the respective icon is determined. A symbol corresponding to the respective icon is displayed superimposed over one or more additional icons in the plurality of icons while the contact is maintained.