SUB-KEYBOARDS WITH KEYS DEPENDENT ON THE FREQUENCY OF USE

An electronic device (100) and a method of operating an electronic device (100) is presented, where the electronic device (100) includes a touch-sensitive display unit (104, 300), a processing unit (301) and a graphical user interface environment including keys (401) for user input. Firstly, a first subgroup of keys is selected out of a group of keys, using the processing unit (301), where the selection is based on the relative usage of the keys. Then the first keyboard (403) including the first subgroup of keys is displayed, on the touch-sensitive display unit (104, 300). Further, it is included to detect, using the touch-sensitive display unit (104, 300), a contact with the touch-sensitive display unit (104, 300) while the first keyboard (403) is being displayed and if the detected contact corresponds to a predefined gesture displaying, on the touch-sensitive display unit (104, 300), a second keyboard (404) comprising a second subgroup of keys out of the group of keys. The keys are selected such that keys included in the first subgroup of keys have higher relative usage than the keys comprised in the second subgroup of keys.
SUBKEYBOARDS WITH KEYS DEPENDENT ON THE FREQUENCY OF USE

TECHNICAL FIELD

[0001] The present disclosure relates, generally, to an electronic device that includes a touch-sensitive display unit and a method for the electronic device, and, more particularly, to an alternating keyboard comprised in a graphical user interface of the electronic device.

BACKGROUND

[0002] Many electronic devices, such as wireless communication terminals (e.g., mobile phones), personal digital assistants (PDAs), laptop computers and the like, include touch-sensitive displays, which often include touch screens. Touch-sensitive displays offer several advantages e.g. they allow users to make user inputs and selections by directly touching the displayed item. Therefore, touch-sensitive display offer users a very intuitive and user friendly way of interacting with the electronic device.

[0003] Keyboards/Keypads on electronic devices can be of various types and may comprise various lay-out arrangements. Touch-sensitive displays are e.g. also used as keyboard/keypad. This is convenient because it removes the need for a dedicated hardware keyboard. The characters in a keyboard/keypad are in today's electronic devices most often arranged as a so-called QWERTY keyboard/keypad, also for electronic devices having touch-sensitive displays. However, for electronic devices having a limited display area, such as e.g. handheld phones, the keys must inherently be very small to fit the entire keyboard, including all the alphabetic letters, on the display area and therefore the user may find it difficult to hit the correct key and not a nearby key. This makes the use of the touch-sensitive display as keyboard/keypad less convenient and somewhat unreliable.

SUMMARY

[0004] It is an object in this disclosure to basically address the problems outlined above. These objects and others may be obtained by providing a method and electronic device according to the independent claims attached below.

[0005] According to one aspect, a method of operating an electronic device is provided, where the electronic device includes a touch-sensitive display unit, a processing unit and a graphical user interface environment including keys for user input. The method includes selecting a first subgroup of keys out of a group of keys, using the
processing unit, where the selection is based on the relative usage of the keys. The method further includes displaying, on the touch-sensitive display unit, a first keyboard including the first subgroup first subgroup of keys. Furthermore the method includes detecting, using the touch-sensitive display unit, a contact with the touch-sensitive display unit while the first keyboard is being displayed; and if the detected contact corresponds to a predefined gesture displaying, on the touch-sensitive display unit, a second keyboard comprising a second subgroup of keys out the group of keys. In the method the keys are selected such that keys included in the first subgroup of keys have higher relative usage than the keys comprised in the second subgroup of keys.

According to a second aspect, an electronic device is provided. The electronic device includes a graphical user interface environment, which includes keys for user input. The electronic device further includes a processor unit configured to select a first subgroup first subgroup of keys out of a group of keys, where the selection is based on the relative usage of the keys. Furthermore the electronic device includes a touch-sensitive display unit. The touch-sensitive display unit is configured to, firstly, display a first keyboard comprising the first subgroup first subgroup of keys and, secondly, to detect a contact with the touch-sensitive display while the first keyboard is being displayed. If the detected contact corresponds to a predefined gesture the touch-sensitive display unit is configured to display a second keyboard including a second subgroup of keys out the group of keys. The processing unit is configured to select the keys such that the keys included in the first subgroup first subgroup of keys have a higher relative usage than the keys comprised in the second subgroup of keys.

According to a third aspect, a computer program product for operating an electronic device is provided, where the electronic device includes a touch-sensitive display unit and a processing unit. The computer program product includes instructions to select a first subgroup first subgroup of keys out of a group of keys, wherein the selection is based on the relative usage of the keys. The computer program product further includes instructions to display a first keyboard comprising the first subgroup of keys. Furthermore, the computer program product includes instruction to detect a contact with the touch-sensitive display while the first keyboard is being displayed and if the detected contact corresponds to a predefined gesture to display a second keyboard comprising a second subgroup of keys out the group of keys. The computer program product provides instruction such that the keys comprised in the first subgroup of keys have a higher relative usage than the keys comprised in the second subgroup of keys.
According to a fourth aspect, a computer readable medium including program code is provided. When the program code is executed by a processing unit included in an electronic device having a touch-sensitive display unit it causes, firstly, the processing unit to select a first subgroup of keys out of a group of keys, where the selection is based on the relative usage of the keys. The program code, secondly, causes the touch-sensitive display unit to display a first keyboard comprising the first subgroup of keys on the touch-sensitive display and to detect a contact with the touch-sensitive display while the first keyboard is being displayed and if the detected contact corresponds to a predefined gesture, the program code further causes the touch-sensitive display unit to display a second keyboard comprising a second subgroup of keys out the group of keys. The keys comprised in the first subgroup of keys have a higher relative usage than the keys comprised in the second subgroup of keys.

According to a fifth aspect, a graphical user interface for display on a touch-sensitive display included in an electronic device including a processing unit is provided. The graphical user interface includes a first keyboard includes a first subgroup of keys selected out of a group of keys, where the selection is based on the relative usage of the keys and, where, if a contact is detected, by the touch-sensitive display unit, that corresponds to a predefined gesture, the graphical user interface includes a second keyboard including a second subgroup of keys selected out of the group of keys, where the keys comprised in the first subgroup of keys have a higher relative usage than the keys comprised in the second subgroup of keys and, otherwise, the graphical user interface includes the first keyboard.

An advantage that may be achieved when using above solution is that it becomes more convenient for a user to use the touch-sensitive display as a keyboard/keypad. The keyboard is split into two keyboards where one keyboard includes keys which have a higher relative usage compared to the keys included in the other keyboard. This allows the keyboards to utilize a larger area of the touch-sensitive display and consequently the individual keys can utilize a larger area. The large area keys improves usability and reduces mistakes, e.g. that a user when typing a text message accidently presses a nearby key.

Further possible features and benefits of the invention will be explained in the detailed description below.
BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of embodiments described herein, and to show more clearly how they may be carried into effect, reference will now be made, by way of illustration only, to the following drawings in which:

Figures 1a and 1b illustratively show the front side and rear side, respectively, of an exemplary electronic device;

Figure 2 illustratively show a QWERTY keyboard on a touch-sensitive display unit;

Figure 3 is a flow diagram of an exemplary embodiment;

Figure 4 shows the letter frequency in the English language;

Figure 5 illustratively shows an QWERTY keyboard, a first keyboard including first subgroup of keys and a second keyboard including a second subgroup of keys, where the keys included in the first subgroup of keys have higher relative usage;

Figure 6 shows a user swiping his finger across a touch-sensitive display unit to shift from a first keyboard to a second keyboard;

Figure 7 schematically illustrates a block diagram of an exemplary electronic device.

DETAILED DESCRIPTION

[0011] Briefly described, the embodiments described below can be used for an electronic device comprising a touch-sensitive display, such as a cellular phone, where the display is used to display a keyboard/keypad that a user can operate by touching keys with his fingers on the display to input corresponding characters to the electronic device.

[0012] In the following description, the solution will be described in more detail with reference to some example embodiments and to the accompanying drawings. For purpose of explanation and not limitation, specific details are set forth, such as particular scenarios, techniques, etc., in order to provide a thorough understanding of the embodiments. However, it is apparent to one skilled in the art that the solution is not limited to these examples but may be implemented in practice by means of other possible embodiments as compared to the details outlined below.

[0013] Moreover, those skilled in the art will appreciate that the functions and units explained herein may be implemented using software functioning in conjunction with a programmed microprocessor or a general purpose computer, and/or using an application specific integrated circuit (ASIC). It will also be appreciated that while the embodiments are
primarily described in the form of methods and devices, the embodiments may also be
realized in a computer program product as well as in a system comprising a computer
processor and a memory coupled to the processor, wherein the memory is encoded with one
or more programs that may perform the functions disclosed herein.

[0014] Figures 1a and 1b show an illustrative example of an electronic device 100
used in the exemplary embodiments, e.g. a cellular phone or a tablet PC. Figure 1a shows the
front side of the electronic device comprising a touch-sensitive display 104, including a
display area 101. The display unit is arranged to display images and other items such as the
above-mentioned keyboard/keypad. The display unit may include a LCD, OLED, PolyLED,
LED, plasma display or any other conventional display. The display area may include a status
indication area 102 and one or more soft key bars 103. The status indication area may for
example include symbols indicating battery status, signal strength, speaker on/off, time and
date etc.

[0015] Electronic devices typically include one or more user input units, which are
arranged to detect user commands and user inputs. The user normally controls the electronic
device using the user input unit e.g. the user can increase/decrease speaker volume or turn the
electronic device on and off. Users can also use various user input units such as the
keyboard/keypad for entering commands, typing text messages or dialing telephone numbers.
The user input units may include soft keys 103, hard keys 106, buttons, joysticks, or
multidirectional buttons and can also include touch-sensitive areas and touch-sensitive
displays such as a touch-pad or a touch-screen. A touch-sensitive display 104 is a display
comprising functionality to detect or register user commands or user inputs. The touch-
sensitive display may comprise a touch-screen overlying the display, where the user taps
directly on a selected item, e.g. a key, displayed on the display and the touch-screen detects
or registers the user selection.

[0016] An exemplary electronic device may also include other elements normally
present in such devices, such as a keypad 106, a speaker 107, a microphone 105, a front
camera unit 108, a processor, a memory or storage unit, an AM/FM radio transmitter and
receiver.

[0017] Figure 1b shows the rear side of an exemplary electronic device including a
backside of the casing, a digital camera unit with a lens 109, a light source 110 serving to
provide additional light when capturing images, a battery hatch 111 concealing and
protecting a battery and a SIM-card (Subscriber Identity Module). The electronic device
further includes a communication unit adapted, e.g., for short-range wireless communication (Bluetooth, Near Field Communication (NFC), Infrared, and Wireless LAN (W-LAN: according to the IEEE 802.11 standards)), long-range wireless communication (e.g. according to cellular standards such as 2G, 3G or Long Term Evolution (LTE or 4G), and/or wired communication. Other examples of electronic devices that can be used in the exemplary embodiments include, but not limited to, camcorder, compact cameras, system cameras, MP3 players, Laptop PCs, and portable game consoles.

[0018] Figure 2 shows an exemplary QWERTY keypad displayed on the touch-sensitive display unit 104 of an electronic device 100. A QWERTY keypad is defined by the order in which the keys are arranged. In an exemplary QWERT keypad the letters Q, W, E, R, T, Y are positioned in the top-right corner and the remaining letters in the specific sequence shown in Fig 2. QWERTY keypads have been used for a long time on all kinds of electronic devices and before that on mechanical devices such as type-writers. In the past, keypads included hardware keys but more recently QWERTY keypads are also used on touch-sensitive displays. On a touch-sensitive display the keys are displayed on the display and when the key is pressed e.g. by touching the key on the display, the touch-sensitive display detects the touch. The touch typically corresponds to the pressing of a key. Some advantages with having the QWERTY keypad on a touch-sensitive display unit may include, firstly, that the touch-sensitive display can also be used both as a keypad/keyboard and at the same time as a normal display thereby saving space compared an electronic device having both a hardware keyboard and a separate display, and, secondly, that the keypad on a touch-sensitive display can be adjusted, e.g., in size or by order in which the keys are arranged or the appearance of the keys.

[0019] On touch-sensitive displays the QWERTY keypad may switch between portrait and landscape layouts, Figure 2 shows the keypad in landscape lay-out and Figure 6 shows the keypads in portrait lay-out. Some electronic devices are equipped with accelerometers or gyroscopes which make it possible to sense the relative orientation of the electric device and depending of the orientation of the electronic device the orientation of QWERTY keypad is adjusted.

[0020] A keypad may comprise a wide range of keys where the keys may be letters in an alphabet, characters, numbers, symbols, signs or function keys. Keys may also be control means by which the user can control the operation of the electronic device or an application running on the electronic device. Examples of such a key may be softkeys by which the user
can operate a music player including start to play, fast forward, rewind, or stop a song. Keys may also be assigned for special functions such a quick launch of Internet or E-mail applications.

[0021] An exemplary embodiment will now be described with reference to the flow chart in Fig. 3 and with further reference to the exemplary electronic devices illustrated in Figures 1-2. A key is displayed on the touch-sensitive display of an electronic device, where the key may be a letter key such as the letter A. When the key is selected and touched by the user, that key selection is registered using the touch-sensitive display, step 201. The total of number key selections is recorded for each key, step 202. The number of recorded key selections may be stored in the memory unit 302. The key selection may include a key press or a contact with the key or any other way that a user may select a key. In step 203 the relative usage of a key is determined. The relative usage of the key is determined based on how often the key is used on the actual electronic device. The number of key presses or the number of times a a contact is made with the key is then used to determine the relative usage of a key. In an illustrative example it is assumed that the letter A has been pressed 2479 times, the letter B has been 347 times, the letter C has been pressed 697 times, etc out of a total of 25 182 key presses, and in that case the relative usage of the letter A is 9.8%, for B it is 1.3%, for C it is 2.8% etc.

[0022] The relative usage of the key may also be determined by the letter frequency in a language, i.e. how often that letter is normally used in that language in general. Figure 4 shows the letter frequency in the English language. The letter E is according the Figure 4 the most frequently used letter in the English language, with a relative usage of 12.7%, followed by the letter T, which has 9.1% relative usage. The letter frequency in a language may be stored in a memory unit 302 of the electronic device or it may be downloaded to the electronic device using one or more communication units of the electronic device.

[0023] Furthermore the relative usage of key may be determined in a certain context, e.g., the relative usage may vary depending on various contextual parameters such as time, location, user etc. In an illustrative example, the relative usage varies with the location and/or time-of-the-day. When the user of electronic device is at work he uses the letters E, T very frequently because he mainly types in the English language and while he seldom or never the uses the letters A, Å, Ö. However, when he is at home he uses the letters A, Å, Ö more often because he mainly types in the Swedish language. The relative usage of the letters E, T is higher if the location is the workplace and during daytime than if the location is the home environment and during nighttime. Similarly, the relative usage of the letters A, Å, Ö is lower
when the location is the workplace and during daytime than if the location is the home environment and during nighttime, i.e. the relative usage of a key may vary depending on the location, and on the time of day.

[0024] The context wherein the relative usage of key is determined may also be dependent of the user. For example, an electronic device may be shared by several members of a family, where every family member may be associated with an identity. Each family member logs on to the electronic device whereby all settings in the electronic device become adapted to that specific family member. The key presses may in that case be counted separately for each family member and since the vocabulary used by the parents is different from the vocabulary used by children, the relative usage of the keys varies depending on the user of the electronic device.

[0025] In step 204 a first subgroup of keys is selected out a group of keys. In an illustrative example the keys are letters and a group of keys represent an alphabet with a set of letters. The selection of keys may include selecting the most commonly used letters in a language. In the English language the most commonly used letters are E, T, U, I, O, A, S, D, H, C, N, M, L and the least used letters are Q, W, R, Y, P, F, G, J, K, Z, X, V, B, according to Fig. 4. The first subgroup of keys may therefore include the most commonly used letters and a second subgroup of keys may include the least used letters. In the embodiment shown in Fig. 5 a first keyboard includes a first subgroup of keys, which includes the letters E, T, U, I, O, A, S, D, H, C, N, M, L and the letters were selected based on their relative usage in the English language, i.e. in this particular example the letter frequency in English. A second keyboard including the second subgroup of keys, which includes the letters Q, W, R, Y, P, F, G, J, K, Z, X, V, B, which are selected to be included in the second subgroup based on their relative usage. Electronic devices such as mobile phones may have relatively small displays and therefore the area occupied by each letter is rather small. The small area is a limitation when the display is a touch-sensitive display because the area that the user has to hit when selecting a key is small. To increase the area on the display that is occupied by each letter either the first keyboard 403 including the first subgroup of keys or the second keyboard 404 including the second subgroup of keys is displayed one at a time and not simultaneously on the touch-sensitive display, as shown in Fig. 5. Figure 5 shows a QWERTY keyboard 402 and how the letters, or keys, 401 comprised in the QWERTY keyboard may be divided into a first keyboard 403 and second keyboard 404 which are displayed separately.

[0026] In step 205 a contact with the touch-sensitive display is detected. The touch-sensitive display may include a touch-screen that is devised to detect contacts between the
user’s fingers and the touch-sensitive display. If a detected contact corresponds to a predefined gesture, the touch-sensitive display switches from displaying a first keyboard to displaying a second keyboard. Thereby, the user can easily select which keyboard to use. The contact may include a swiping gesture, one or more taps, or specific touch patterns. The swiping gesture includes dragging the finger over the touch-sensitive display while in contact with the touch-sensitive display. The swiping gesture may include swiping the finger from left-to-right, right-to-left, top-to-bottom, bottom-to-top or any combination of these swiping motions. A tap includes the finger being in contact with the touch-sensitive display for a time interval which is less than predefined time value. The predefined gesture may also include two or more consecutive taps. The predefined gestured may be chosen by user or it may be preprogrammed and stored in the memory unit 302 of the electronic device.

[0027] Assuming that the first keyboard is displayed on the touch-sensitive display then, if a contact with the touch-sensitive display does not correspond to a predefined gesture then the touch-sensitive display unit will still display the first keyboard, step 206, however, if the contact corresponds to the predefined gesture a second keyboard comprising a second subgroup of keys will be displayed on the touch-sensitive display, step 207. In Fig. 6 a first keyboard is displayed. The first keyboard includes a first subgroup of keys comprising the letters E, T, U, I, O, A, S, D, H, C, N, M, L, which were selected based on their relative usage in the English language. A user swipes his finger across the touch-sensitive display from the top of the display to the bottom of the display, see Fig. 6. The contact is detected by the touch-screen included in the touch-sensitive display unit. The swipe gesture corresponds to a predefined gesture and the second keyboard comprising the letters Q, W, R, Y, P, F, G, J, K, Z, X, V, B is displayed. If the user would have tapped a finger on the display and the tapping was not a predefined gesture the display unit would still display the first keyboard.

[0028] The contact that the user makes with the touch-sensitive display is compared with a predefined gesture. If the first keyboard is displayed on the touch-sensitive display and a contact that corresponds to a predefined gesture is detected then the touch-sensitive display changes from displaying the first keyboard to displaying the second keyboard. Similarly, if the second keyboard is being displayed and a contact that corresponds to a predefined gesture is detected then the touch-sensitive display changes from displaying the second keyboard to displaying the first keyboard. In a further illustrative embodiment there may be a first predefined gesture and a second predefined gesture, where for example the first predefined gesture comprises a swiping gesture from left-to-right and the second predefined gesture comprises a swiping motion from right-to-left. If the first keyboard is displayed on the touch-
sensitive display and a contact that corresponds to the second predefined gesture then the display unit will display the second keyboard and if the contact corresponds to first predefined gesture the display unit will continue to display the first keyboard. If the second keyboard is displayed on the display unit and a contact that corresponds to the first predefined gesture then the display unit will display the first keyboard and if the contact corresponds to second predefined gesture the display unit will continue to display the second keyboard. When the touch-sensitive display switches from displaying the first keyboard to displaying the second keyboard, the first keyboard is occluded or removed from the display area, step 208 and the touch-sensitive display will not display the first display anymore.

Alternatively, the first keyboard may be reduced in size relative to second keyboard. The second keyboard may also overlay the first keyboard, and at the same time it may be of varying transparency thereby allowing varying visibility of the first keyboard. These exemplary embodiments are also applicable when switching from the second keyboard to the first keyboard, when the second keyboard is occluded.

Figure 7 schematically illustrates a block diagram of an exemplary electronic device (100). The electronic device includes a graphical user interface (GUI) environment, for operating the electronic device, for example, the GUI may include widgets, menus and folder structure and may further comprising keys for user input. The GUI is often displayed on the display unit of the electronic device. The keys included in the GUI are preferably soft keys, which can be displayed on the touch-sensitive display and which are used for user input, for example selecting an item in a menu-list or for typing letters when composing a text message or typing the URL (Uniform Resource Locator) of a webpage in the browser.

The electronic device further comprises a touch-sensitive display unit 300. The touch-sensitive display unit 300 comprises a display unit 300a and a touch-screen unit 300b. The display unit 300a is configured to display the first keyboard comprising the first subgroup of keys and the second keyboard comprising the second subgroup of keys, as shown in Fig. 6. The touch-screen unit 300b is configured to detect a contact with the touch-sensitive display unit, the contact may include the user using his finger to make selections in the GUI of the electronic device for example to input data, to select an item in a menu-list or for typing letters when composing a text message or typing the URL (Uniform Resource Locator) of a webpage in the browser. The touch-screen unit is configured to detect contacts with the touch-sensitive display unit that may comprise a swiping gesture, one or more taps, or other specific touch patterns. The swiping gesture includes dragging the finger over the touch-sensitive display while in contact with the touch-sensitive display unit. The swiping
gesture may comprise swiping the finger from left-to-right, right-to-left, top-to-bottom, bottom-to-top or any combination of these swipes. A tap may comprise the finger in contact with the touch-sensitive display for time interval which is less than predefined time value. If the touch-sensitive display unit displays a first keyboard and the contact that the user makes with the touch-sensitive display unit corresponds to a predefined gesture then the touch-sensitive display unit will display a second keyboard. Similarly, if the touch-sensitive display unit displays a second keyboard and the contact that the user makes with the touch-sensitive display unit corresponds to a predefined gesture then the touch-sensitive display unit will display a first keyboard.

[0031] The touch-screen unit may also comprise sensors that can detect that a finger is in proximity of the display or hovering over the display. This allows the touch-screen unit to detect a 'fictional' contact with the display, i.e. that the user can point in the proximity of the touch-sensitive display unit and make a selection without necessarily making physical contact with the touch-sensitive display unit. The contact describe above may include a 'fictional' contact.

[0032] The electronic device further comprises a processor unit 301, where the processor unit is configured to select a first subgroup of keys out of a group of keys. The selection is based on the relative usage of the keys. The group of keys may include the letters of an alphabet and the keys in the first subgroup of keys may be letters selected based on their frequency in the language. The first subgroup of keys is included in a first keyboard. The processor unit (301) also selects a second subgroup key based on their relative usage. The second subgroup of keys is comprised in a second keyboard. The processor unit selects the keys for the first subgroup and second subgroup such that the keys in the first subgroup have higher relative usage. The processor unit is further configured to determine the relative usage of a key in a context and wherein the keys comprised in the first subgroup of keys have a higher relative usage than the keys comprised in the second subgroup of keys in said context. The context may for example be a language, a location, or a time/date of usage, or a user.

[0033] The electronic device further comprises a memory unit (302) devised to store data. The touch-sensitive display unit is further configured to register a contact with a key displayed on the touch-sensitive display unit and to record the number of registered contacts with the key. The number of registered contacts may be stored in a memory unit (302) comprised in the electronic device. The memory unit is further configured to store letter frequency of languages, e.g. the letter frequency in the English language. The processor unit
is furthermore configured to use the data stored in the memory unit to determine the relative usage of the key, and based on the relative usage assign the key to the first keyboard or to the second keyboard.

[0034] It should be noted that the above-mentioned embodiments are used here to illustrate rather than limit the invention, and that those skilled in the art are free to use alternative embodiments without departing from the scope of the appended claims. The word "comprising" does not exclude the presence of elements or steps other than those listed in a claim, "a" or "an" does not exclude a plurality, and a single processor or other unit may fulfill the functions of several units recited in the claims. Any reference signs in the claims shall not be construed so as to limit their scope.
CLAIMS:

1. A method for an electronic device (100), the electronic device comprising a touch-sensitive display unit (104, 300), a processing unit (301) and a graphical user interface environment comprising keys (401) for user input, the method comprising:
   - selecting (204) a first subgroup of keys out of a group of keys, using the processing unit, wherein the selection is based on the relative usage of the keys;
   - displaying (206), on the touch-sensitive display unit, a first keyboard (403) comprising the first subgroup of keys;
   - detecting(205), using the touch-sensitive display unit, a contact with the touch-sensitive display unit while the first keyboard is being displayed; and if the detected contact corresponds to a predefined gesture:
     - displaying (207), on the touch-sensitive display unit, a second keyboard (404) comprising a second subgroup of keys out the group of keys;
   wherein the keys comprised in the first subgroup of keys have higher relative usage than the keys comprised in the second subgroup of keys.

2. A method as claimed in claim 1, further comprising the step of:
   - determining (203), using the processing unit, the relative usage of a key in a context; and wherein the keys comprised in the first subgroup of keys have a higher relative usage than the keys comprised in the second subgroup of keys within said context.

3. A method as claimed in claim 2, wherein the context comprises at least one of:
   a language, a location of usage, a time of use, and an identity of the user using the electronic device.

4. A method as claimed in any of claims 1-3, wherein the method further comprises the steps of, using the touch-sensitive display unit:
   - registering (201) a contact with a key displayed on the touch-sensitive display unit;
recording (202) the number of registered contacts with the key; and wherein
the relative usage of the key is determined by the number of recorded contacts.

5. A method as claimed in any of claims 1-4, wherein the keys comprise letters
and the group of keys comprise an alphabet.

6. A method as claimed in any of claims 1-5, wherein the relative usage of the
keys is based on the letter frequency in a language.

7. A method as claimed in any of claims 1-6, wherein the predefined gesture
comprises a swiping motion.

8. A method as claimed in any of claims 1-7, wherein the predefined gesture
comprises one or more taps.

9. A method as claimed in any claims 1-8, wherein when the detected contact
corresponds to the predefined gesture the method further comprising the step of:
- occluding (208) the first keyboard comprising the first subgroup of keys.

10. An electronic device (100) comprising a graphical user interface environment,
which comprises keys (401) for user input, the electronic device comprising:
-a processor unit (301) configured to:
- select a first subgroup of keys out of a group of keys, wherein the selection is
  based on the relative usage of the keys; and
-a touch-sensitive display unit (104, 300) configured to:
- display a first keyboard (403) comprising the first subgroup of keys;
- detect a contact with the touch-sensitive display unit while the first keyboard
  is being displayed;
- and if the detected contact corresponds to a predefined gesture,
  display a second keyboard (404) comprising a second subgroup of keys out the
  group of keys;
wherein the keys comprised in the first subgroup of keys have a higher relative usage than the
keys comprised in the second subgroup of keys.
An electronic device as claimed in claim 10 wherein the processor unit is further configured to:
- determine the relative usage of a key in a context and wherein the keys comprised in the first subgroup of keys have a higher relative usage than the keys comprised in the second subgroup of keys in said context.

An electronic device as claimed in any of claims 10-11 wherein the context is a language or a location of usage or a time of use or a user using the electronic device.

An electronic device as claimed in any of claims 10-12 wherein the touch-sensitive display unit is further configured to:
- register a contact with a key displayed on the touch-sensitive display unit
- record the number of registered contacts with the key and wherein the relative usage of the key is determined by the number of recorded contacts.

An electronic device as claimed in any of claims 10-13, wherein the keys are letters and the group of keys comprise an alphabet.

An electronic device as claimed in any of claims 10-14, wherein the relative usage of the keys is determined based on the letter frequency in a language.

An electronic device as claimed in any of claims 10-15 method as claimed in any of claims 1-5, wherein the predefined gesture comprises a swipe motion.

An electronic device as claimed in any of claims 10-16, wherein the predefined gesture comprises a one or more taps.

An electronic device as claimed in any claims 10-17, wherein the touch-sensitive display unit is further configured to occlude the first keyboard comprising the first subgroup of keys if the detected contact corresponds to the predefined gesture.

A computer program product for operating an electronic device (100) having a touch-sensitive display unit (104, 300) and a processor unit (301), the computer program product comprising instructions for:
- selecting a first subgroup of keys out of a group of keys, wherein the selection is based on the relative usage of the keys;
- displaying a first keyboard (403) comprising the first subgroup of keys;
- detecting a contact with the touch-sensitive display unit while the first keyboard is being displayed; and if the detected contact corresponds to a predefined gesture
- displaying a second keyboard (404) comprising a second subgroup of keys out the group of keys;
wherein the keys comprised in the first subgroup of keys have a higher relative usage than the keys comprised in the second subgroup of keys.

20. A computer readable medium comprising program code, which when executed by a processor unit (301) comprised in an electronic device (100) having a touch-sensitive display unit (104, 300) causes the processor unit to:
- select a first subgroup of keys out of a group of keys, wherein the selection is based on the relative usage of the keys;
and the touch-sensitive display unit (104, 300) to
- display a first keyboard (403) comprising the first subgroup of keys on the touch-sensitive ;
- detect a contact with the touch-sensitive display unit while the first keyboard is being displayed; and if the detected contact corresponds to a predefined gesture
- display a second keyboard (404) comprising a second subgroup of keys out the group of keys;
wherein the keys comprised in the first subgroup of keys have a higher relative usage than the keys comprised in the second subgroup of keys.

21. A graphical user interface for display on a touch-sensitive display unit (104, 300) comprised in an electronic device (100) comprising a processor unit (301), the graphical user interface comprising:
- a first keyboard (403) comprising a first subgroup of keys selected out of a group of keys, wherein the selection is based on the relative usage of the keys; and
- wherein if a contact is detected by the touch-sensitive display unit that corresponds to a predefined gesture, the graphical user interface comprises a second keyboard (404) comprising a second subgroup of keys selected out of the group of keys,
wherein the keys comprised in the first subgroup of keys have a higher relative usage than the keys comprised in the second subgroup of keys; and

otherwise the graphical user interface comprises the first keyboard.
Register the contact with a key displayed on the touch-sensitive display unit

Record the number of registered contacts with the key

Determine the relative usage of a key

Select a first group of keys out of a group of keys

Detect a contact with the touch-sensitive display

Does contact correspond to a predetermined gesture?

Yes

Occlude first keyboard

No

Display first keyboard

Display second keyboard including a second group of keys
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Figure 4
Figure 7

100

Touch-Sensitive Display Unit (300)

Display Unit (300a)

Memory Unit (302)

Touch-Screen Unit (300b)

Processor Unit (301)
## INTERNATIONAL SEARCH REPORT

**International application No**

PCT/SE2012/051307

### A. CLASSIFICATION OF SUBJECT MATTER

**INV.** G06F3/0488

**ADD.**

According to International Patent Classification (IPC) or to both national classification and IPC

### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06F 4H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

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* Special categories of cited documents:

- **X** later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- **Y**- document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- **Y+** document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- **A** document member of the same patent family

**Date of the actual completion of the international search**

14 August 2013

**Date of mailing of the international search report**

26/08/2013

**Name and mailing address of the ISA/**

European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk

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Kim-Mayser, Michael
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