

1 USER INTERFACE FOR SEARCHING A LARGE DATA SET

2
3 This patent application claims priority benefit of Singapore Patent Application
4 No. 10201507782W, filed on 18 September 2015.

5 6 FIELD OF THE INVENTION

7
8 [0001] This invention relates to user interfaces for data sets presented on electronic
9 devices such as computers, and more particularly to an improved user interface and
10 related method using a slider which is suitable for searching, sorting and accessing
11 information in large data sets.

12 13 BACKGROUND OF THE INVENTION

14
15 [0002] Large data sets can be difficult to search for relevant information. Large data
16 sets are often structured or organized in some manner, such as chronologically or by
17 category, or amount, for example. The data can be hosted remotely or on a local
18 device. A big challenge with such large data sets is enabling a user of the device to
19 efficiently filter and navigate the data given the screen size limitations and input
20 methods of the mobile device. For example, a messaging application may contain
21 thousands of messages within a conversation through which the user must scroll
22 through to reach a desired date; finding emails in an inbox is difficult to navigate and
23 filter; a music library may contain thousands of songs that can be organised against
24 numerous criteria; an airline booking application will have hundreds of flight routes

1 and thousands of flight options to select from; and sports statistics can produce a
2 very large amount of sortable data.

3
4 [0003] Known technologies include sliders which allow you to rapidly sort data by a
5 variable. However known sliders are still cumbersome to work with, especially with
6 large data sets, making their use somewhat limited. It would be desirable to provide
7 a user interface which is easy to use and allows for rapid searching and selection of
8 particular information in the data set, even when the data set is quite large.

9 10 SUMMARY OF THE INVENTION

11
12 [0004] In accordance with a first aspect, there is provided a device, user interface
13 and method for searching a data set presented on a display of the device are
14 disclosed. The method for searching a large data set comprises displaying content
15 comprising at least a portion of the data set in a content window on the display,
16 displaying a slider moveable along a selection path on the display, wherein the
17 selection path corresponds to a range of a field corresponding to a subset of the data
18 set, moving the slider along the selection path to make a selection of a range of the
19 field, displaying the subset of the data set corresponding to the selection in the
20 content window, automatically returning the slider to a return position after the
21 selection has been made and continuing to display the subset of data corresponding
22 to the selection.

23
24 [0005] From the foregoing disclosure and the following more detailed description of
25 various embodiments it will be apparent to those skilled in the art that the present

invention provides a significant advance in the technology of user interfaces. Particularly significant in this regard is the potential the invention affords for providing a user interface which is simple to use and allows for relatively rapid access to a user's desired portion of a large data set when searching such large data sets. Additional features and advantages of various embodiments will be better understood in view of the detailed description provided below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Fig. 1 shows a schematic representation of one embodiment, where the user interface is accessible on a computer such as a mobile device.

[0007] Fig. 2 is a schematic of the display of the mobile device of Fig. 1 shown at a starting position, showing a first field labeling data.

[0008] Fig. 3 is a schematic of the display after pressing and holding the slider down, showing an active label, and moving the slider to make a selection.

[0009] Fig. 4 is a schematic of the display after releasing the slider, showing both the selection made and a second field, and the slider returns to a return position.

[0010] Fig. 5 is a schematic of the display after selecting the selection of the second field of data, and showing a third active level and the slider returned to a return position.

[0011] Fig. 6 is a schematic of the display after selecting the selection of the third selection and releasing the slider button, allowing the slider to return to a return position.

[0012] Figs. 7 and 8 are schematic of the displays showing an embodiment of changing one of the selections; here the third selection is changed from the 25th to the 28th by pressing, holding and then dragging the slider to the 28th (Fig. 7); and then releasing the slider, allowing the slider to return to a return position (Fig. 8).

[0013] Fig. 9 is a schematic of the display showing an embodiment unsetting or clearing or setting selections.

[0014] Figs. 10-12 shows an optional element where the user may change any of the presented fields of data.

[0015] It should be understood that the appended drawings are not necessarily to scale, presenting a somewhat simplified representation of various features illustrative of the basic principles of the invention. The specific design features of the user interface as disclosed here, including, for example, the specific location of the content window and the selection path will be determined in part by the particular intended application and use environment. Certain features of the illustrated embodiments have been enlarged or distorted relative to others to help provide clear understanding. In particular, thin features may be thickened, for example, for clarity of illustration. All references to direction and position, unless otherwise indicated, refer to the orientation illustrated in the drawings.

DETAILED DESCRIPTION OF CERTAIN EMBODIMENTS

[0016] It will be apparent to those skilled in the art, that is, to those who have knowledge or experience in this area of technology, that many uses and design variations are possible for the user interface disclosed here. The following detailed discussion of various alternate features and embodiments will illustrate the general principles of the invention with reference to a user interface and related method for searching a data set suitable for presentation on the display of a device, such as a mobile device like a phone or tablet. Other embodiments suitable for other applications will be apparent to those skilled in the art given the benefit of this disclosure.

[0017] The device can be any electronic device having a processor, a memory, a program and a user interface. Turning now to the drawings, Fig. 1 shows a device 10 in the form of a conventional mobile phone having a display 20. A tablet, laptop, or desktop computer, for example all are convenient alternatives. The display screen is typically a touch (piezo-electric) screen having a series applications, or apps, including S, for a selection slider. Tapping and holding the portion of the display corresponding to the S calls up a user interface which handles a large data set in a known manner. In the example in the drawings, the large data set is a series of text messages. Other suitable data sets could comprise other large amount of data with fields which allow for convenient searching and sorting. The user interface is preferably adapted to work with large data sets from multiple vendors. Music and sports statistics, or other areas with large amounts of data may advantageously use

the user interface and method described herein to quickly and efficiently sort large amounts of data.

[0018] Fig. 2 shows an embodiment of the user interface with the display 20 comprising a content window 30 with content 35. The content is part of a data set; here the content is some of the messages in a chat. Typically it is possible to scroll the content to show portions of the data set in the content window not current visible in the content window of the display. Optionally the content may be labelled specifically (in Fig. 2 showing messages on a specific date: "17 Aug 2012"). The display also has a label zone 50 and a slider 60. The label zone shows each of the fields used in this user interface, such as a first field 51, here the year, represented by the word "YEAR". The slider 60 can be pressed, dragged and released, and is shown to be moveable along a slider selection path 40. Initially the slider may be at any position along the slider selection path. In Fig. 2, the slider is shown in a first return position immediately adjacent the label zone. The selection path 40 can extend vertically (with respect to the display as normally used) and can comprise equally spaced intervals which correspond to intervals of the first field. In the representative example of Fig. 2, the first field 51 is a year, and the intervals are years. Each field is displayed as a user selected value/grouping from a range or subset of data in the data set. Preferably the field will only be displayed in the label zone if the user has made a selection; otherwise the field is hidden from the user.

[0019] Fig. 3 shows how a selection is made for the first field. When the slider 60 is slid down to an interval corresponding to 2014, the first message in 2014 appears in the content window. The slider 60 is actuated, typically by tapping and holding for a

1 short period of time. Then, while the user of the device still is in contact with the
2 slider, he drags the slider down along the selection path. Typically, the user touches
3 the slider with his finger, activates the slider and then slides his finger down the
4 portion of the display corresponding to the selection path while still maintaining
5 contact with the slider until the slider is moved to the desired location/interval on the
6 selection path 40. The selection path 40 is shown to extend along a Y-axis or
7 vertically along the display 20. In accordance with an advantageous element, as the
8 slider moves along the selection path, an active label showing possible selections in
9 the range of the field is also visible. In the embodiment shown in Fig. 3, a first active
10 label 52 is presented along with the slider 60 in the selection path, shown traveling
11 along with the slider as the slider moves along the selection path 40. Optionally a
12 previous and next element 85 may be displayed which is continuously updated as
13 the slider moves along the selection path. This can be helpful when there are gaps
14 in the field of the data set (such as multiple days between text messages.) Another
15 optional element is a shortcut 88 which can be present on the display, for example,
16 at the bottom of the selection path. Tapping and holding or otherwise actuating the
17 shortcut can move the content 30 to show the last items of the field in the content
18 window 40, such as messages at the end of the period of time selected. One
19 additional optional element can be tapping or otherwise actuating the slider button
20 causing the content in the content window to be resent to the first items in the field.
21 In this manner a user can rapidly move between the beginning and the end of a field
22 of a data set.

23
24 [0020] Fig. 4 shows what happens after a selection has been made for the first field.

25 The content window 30 is updated with content corresponding to the beginning of the

subset of data in the first field. The selection 57 is presented in the label zone 50. Also presented is a second field 53; here the second field is months, and therefore the word "MONTH" appears. Once the slider is slid down the selection path, a second active label is created; this time corresponding to the second field. As before, preferably the active label can travel with the slider, and the presentation on the display changes with each interval of the second field. That is, a series of different named months appears as the active label, helping the user make a selection.

[0021] As discussed above, the data set is accessible by operation of the slider 60, data of the data set is grouped into tiers labeled by fields, and selections 57, 58, 59 corresponding to the fields of data (51 - first field, 53 - second field and 55 - third field) in the data set may be made using the slider. Any number of fields may be used, and other fields such as content of a message, name of the person sending the message, time of day of the message, etc., may be substituted as an alternate field. In accordance with a highly advantageous element, the slider is springy. That is, after the user presses and holds the slider, and then slides the slider to make a selection, the user releases the slider, and then the slider automatically returns to a return position after the selection has been made. Also, the subset of data corresponding to the selection continues to be displayed in the content window, and preferably can be reviewed later, even if the display powers down for a period of time due to lack of use of the device, for example. In the embodiment shown in Fig. 4, the return position for the slider 60 is immediately adjacent and below the label zone 50. The return to the return position happens immediately after releasing the slider, so the slider appears to spring back to a position immediately adjacent the label

1 zone. Preferably the next field appears concurrently, ready for a next selection, and
2 the slider is immediately adjacent the next field, as shown.

3
4 [0022] Fig. 5 shows the result of making a second selection 58. Generally multiple
5 selections can be made sequentially, and after each selection is made, each
6 selection is presented in the label zone. In this case, both the first selection 57
7 (2014) and the second selection 58 (Dec) are visible in the label zone 50. Each of
8 the selections can be stacked vertically one on top of another, with the first tier at the
9 top and with the most recently selected field/value at the bottom of the labels. The
10 slider returns to a return position, here a second return position 63 which is
11 preferably immediately adjacent the label zone 50; and most preferably the slider
12 automatically returns to the second return position 63, slightly below the first return
13 position 62 to allow room for the second selection. The return positions can be the
14 same or different. The intervals of the selection path are, as before, automatically
15 updated to reflect intervals of a new field.

16
17 [0023] Fig. 6 shows the results of making a third selection, which preferably is a
18 process similar to making the second selection. This time, the third field is DAY, and
19 sliding the slider (and third active field) down to make a third selection of a particular
20 day, all three selections 57, 58, 59 are visible in the label zone 50, and the slider has
21 returned to a third return position 63. The first selection and the second selections
22 preferably remains the same while the third selection is being made. The selection
23 path intervals are now days instead of months. The content window 30 may show all
24 of the text messages from the selected day/month/year, ordered chronologically, and
25 may also show a heading. Other techniques for ordering data such as by amount or

1 alphabetically will be readily apparent to those skilled in the art given the benefit of
2 this disclosure. Advantageously only a single slider is required, and a can be
3 operated using just one finger. This process can be repeated additionally if desired.
4 Since it is a repetitive process where efficiency is at a premium, it is highly desirable
5 to have both the active label travel with the slider (and be continuously updated), and
6 to have the slider return to a return position after selections have been made, so
7 additional selections can be made quickly. The user interface and process disclosed
8 herein advantageously eliminates steps which would otherwise make the process
9 more tedious.

10
11 [0024] Figs. 7-8 disclose an embodiment for changing the selection of the data set
12 used for searching. In Fig. 7, the user would like to change the most recently
13 selected selection, here the day, from the 25th to the 28th. The user presses and
14 holds the slider 60 to activate the slider. This turns the third selection back into the
15 third active label 63. Next, the user slides the slider (and third active label 56) on the
16 display down to an interval on the selection path 40 corresponding to the desired
17 new third selection. Once the user had made his new selection, he releases the
18 slider and as before, the slider automatically moves to the return position 63, the
19 content window is updated with content corresponding to the new selections, and the
20 label zone 50 is updated with the new selections 57, 58, 59. See Fig. 8.

21
22 [0025] Fig. 9 discloses an embodiment where selections are reset or cleared. From
23 the position of the various elements of Fig. 8, for example, a user may press and
24 hold the slider 60 and slide the slider toward the label zone 50. As the slider moves
25 toward each selection, that selection is removed, and the field may be so indicated

1 with an indicator 70 such as the word "CLEAR" as shown for the second field 53 in
2 Fig. 9 to inform the user that the selection is reset. Continuing to hold the slider
3 while moving the slider up into the label zone can eliminate all selections. If the user
4 has not made any selections, or has reset the selections, then after release of the
5 slider the return position can be the first return position, for example; the slider may
6 return to its initial position; a first active label may be positioned adjacent the slider;
7 and all the elements of the interface can default to an initial state/positions such as
8 those shown in Fig. 2.

9
10 [0026] The fields may be set by the developer of the interface. Alternatively, Figs.
11 10-12 discloses an option where the user can reset the fields to be used to sort and
12 select in the data set. In this embodiment a field is changed by pressing and holding
13 the slider 60, then moving the slider into the label zone 50, and then sliding the slider
14 in a direction away from the selection path; for example, at a right angle to the
15 selection path. A horizontal field selection path 80 is shown in Fig. 10 which would
16 be similar to the vertical selection path 40 in that the slider can move along it.
17 Preferably the horizontal field selection path is activated to and presented on the
18 display only after a move of the slider into the label zone. In this case the label zone
19 is in one corner of the display, so the slider is moved into the corner to activate
20 presentation of the horizontal field selection path. Other locations on the display for
21 the label zone and the selection paths will be readily apparent to those skilled in the
22 art given the benefit of this disclosure. Horizontal selection path 80 may have
23 intervals corresponding to a series of different fields, including fields not previously
24 selected. Once the slider is moved back to the label zone, a new field is selected. In
25 Fig. 11, the YEAR field has been eliminated and replaced with a MONTH field 53,

1 and the slider is back in the first return position. Fig. 12 shows the process for
2 making selections with the new fields, which can be the same as before, but with a
3 new selection 58 and fields (MONTH, DAY only) in the label zone 50. After releasing
4 the slider, it springs back to a return position and the previously selected next field
5 59 is ready to be selected. This process can be repeated to select and/or change
6 the order of fields in a manner essentially similar to the process for making
7 selections using the slider on the vertical selection path.

8
9 [0027] From the foregoing disclosure and detailed description of certain
10 embodiments, it will be apparent that various modifications, additions and other
11 alternative embodiments are possible without departing from the true scope of the
12 invention. The embodiments discussed were chosen and described to provide the
13 best illustration of the principles of the invention and its practical application to
14 thereby enable one of ordinary skill in the art to use the invention in various
15 embodiments and with various modifications as are suited to the particular use
16 contemplated. All such modifications and variations are within the scope of the
17 invention as determined by the appended claims when interpreted in accordance
18 with the breadth to which they are fairly, legally, and equitably entitled.

CLAIMS

What is claimed is:

1. A method for searching a data set presented on a display of a device, comprising, in combination, the steps of:

- displaying content comprising at least a portion of the data set in a content window on the display;
- displaying a slider moveable along a selection path on the display, wherein the selection path corresponds to a range of a field corresponding to a subset of the data set;
- moving the slider along the selection path to make a selection of a range of the field;
- displaying the subset of the data set corresponding to the selection in the content window; and
- automatically returning the slider to a return position after the selection has been made, and continuing to display the subset of data corresponding to the selection.

2. The method of claim 1 further comprising displaying the field in a label zone of the display; and

the return position is adjacent the label zone.

3. The method of claim 1 wherein as the slider moves along the selection path, an active label showing possible selections in the range of the field is also visible in the selection path.

1 4. The method of claim 1 further comprising the steps of:
2 pressing and holding the slider to allow the slider to move along the selection
3 path;
4 the step of automatically returning the slider comprises releasing the slider,
5 wherein the slider immediately returns to the return position.

6
7 5. The method of claim 4 further comprising the step of changing the selection
8 by pressing and holding the slider, and then moving the slider along the selection
9 path.

10
11 6. The method of claim 5 further comprising the steps of
12 clearing the selection by pressing and holding the slider, and then
13 sliding the slider into the label zone.

14
15 7. The method of claim 6 wherein an indicator appears in the label zone when
16 the selection has been cleared.

17
18 8. The method of claim 1 further comprising the steps of
19 moving the slider along the selection path to make a second selection of a
20 range of a second field;
21 displaying a subset of the data set corresponding to the second selection in
22 the content window; and
23 automatically returning the slider to another return position after the second
24 selection has been made.

1 9. The method of claim 1 wherein the first selection and a second field are
2 visible in the label zone after the slider has returned to the return position.

3
4 10. The method of claim 1 further comprising the step of changing the field by a
5 user of the device.

6
7 11. The method of claim 10 wherein the step of changing the field comprises
8 pressing and holding the slider, then moving the slider into the label zone, and then
9 sliding the slider at a right angle to the selection path.

10
11 12. A device comprising, in combination:
12 a display displaying content comprising at least a portion of a data set in a
13 content window on the display;
14 a slider moveable along a selection path on the display, wherein the selection
15 path corresponds to a range of a field corresponding to a subset of the data set;
16 wherein the slider is moveable along the selection path to make a selection of
17 a range of the field;
18 the subset of the data set corresponding to the selection is displayed in the
19 content window; and
20 the slider automatically returns to a return position after the selection has
21 been made.

22
23 13. The device of claim 12 wherein a label zone is positioned in one corner of the
24 display, the selection path is positioned adjacent the label zone, and as the slider

1 moves along the selection path, an active label showing possible selections in the
2 range of the field is also visible in the selection path.

3
4 14. The device of claim 13 wherein the selection, once made, is presented in the
5 label zone.

6
7 15. The device of claim 14 wherein multiple selections can be made sequentially,
8 and after each selection is made, each selection is presented in the label zone.