

based on the location of the touch relative to the graphical information (e.g., region sensitivity). For example, a first located object of the graphical information may be magnified 2x and a second located object of the graphical information may be magnified 16x. In yet another embodiment, the expanded portion may be configured to follow the touch as the touch is moved across the touchscreen display. For example, the location of the expanded portion changes in accordance with the location of the touch, i.e., it mirrors the position of the touch.

[0045] Although not shown in FIG. 1, the method may include additional steps such as reverting back to a non expanded state when the touch is no longer detected. In one embodiment, the expansion is deactivated immediately after the touch is no longer detected thereby causing the expanded portion to revert back to its normal state. In another embodiment, expansion is deactivated after a predetermined amount of time, i.e., there is a lag time. The lag time may be preset (e.g., user settable) or it may be based on external factors such as the amount of information located in the expanded area and human factors such as how long the user would take to read or grasp this particular amount of information. The lag time may allow the user to establish if the expanded area is the desired target. If its not the desired target, the user can move their finger to a new target. If it is the desired target, the user may perform additionally steps within the expanded area. By way of example, and not by way of limitation the lag time may be between about 0.5 to about 5 seconds, and more particularly 1 second.

[0046] The speed or rate at which the expanded area reverts back to its normal state may be widely varied. The atrophy can happen quickly or slowly. In one embodiment, the expanded area atrophies from its expanded state to the normal state almost instantaneously. In another embodiment, the expanded area atrophies over some predetermined amount of time, i.e., the area atrophies gradually over time.

[0047] The method may also include receiving inputs within the expanded area. The inputs may for example be a selection input that is implemented with tapping or increased touch pressure. Alternatively, the input may be a gestural input or a data entry input. By way of example, in an expanded state, a virtual scroll wheel may be capable of being manipulated by a swirling finger gesture or text may be entered into an expanded document. In all of these cases, the expansion may be designed to expand a feature or group of features (such as buttons) so that they are adequately sized for finger manipulation.

[0048] Moreover, the method may include detecting a second touch over the touchscreen display and expanding a second area of the touchscreen display proximate to the location of the second touch. In one implementation, the second touch is detected at the same time as the first touch such that the first and second expanded areas are expanded simultaneously (as for example using a multipoint touchscreen). In another implementation, the second touch is detected after the completion of the first touch. In cases such as this, if the second touch occurs during the lag time of the first expansion, then the first expansion may smoothly transition to the second expansion (e.g., as the first gradually shrinks, the second gradually expands). Alternatively, a second touch in the region of the expanded area may cause further expansion. For example, if the expanded portion

includes a plurality of features, a second touch may be used to further expand one or more of the features. Thereafter, the feature may be selected for example by increasing the touch pressure or initiating a third touch such as a tap.

[0049] Alternatively, expansion may not be implemented if more than one touch is detected at the same time, i.e., simultaneously. This “double touch” could be considered a null input for the purposes of expansion.

[0050] The methods mentioned above may be implemented with software or hardware, or a combination of hardware and software. In one embodiment, the method is implemented by an operating system. As such, the method may be implemented during any program or application running in conjunction with the operating system. That is, expansion can occur in any program or application. By way of example, the operating system may correspond to Mac OS, OS/2, DOS, Unix, Linux, Palm OS, and the like. The operating system can also be a special purpose operating system, such as may be used for limited purpose appliance-type computing devices. Operating systems are generally well known and will not be described in greater detail.

[0051] FIG. 2 is a touchscreen display method 150, in accordance with one embodiment of the present invention. The method begins at block 152 where object sensing is performed via the touchscreen of the touchscreen display. The object may for example be a finger or palm of a user's hand. Alternatively, the object may be a stylus. In most cases, the sensing is performed when the object touches the touch sensitive surface of the touchscreen. In other cases, the object may be sensed when the object is placed over, but not in contact with the touchscreen.

[0052] If an object is sensed, the method proceeds to block 154 where the area near the sensed object is expanded. In particular, a portion of the GUI in the vicinity of the object is visually expanded relative to the remaining portions of the GUI. The touch sensitivity associated with the GUI is also expanded. The expanded area may be expanded immediately or it may appear to gradually grow until it reaches its final shape size, elevation, etc.

[0053] In most cases, the visually expanded portion is made to appear like it is protruding out of the image plane. The protruding effect is typically accomplished through graphics such as shading or other similar means. The protruding effect may be implemented in a localized area of the GUI or it may be implemented at a particular GUI image such as a control box, tool bar, user interface element, and/or the like.

[0054] In one embodiment, the expanded portion includes a plateau region and a transition region. During expansion, the target area contained within the plateau region increases in size and magnification. At the same time, the transition region compresses the GUI between the target area contained in the plateau region and the remaining unexpanded portions of the GUI. As a result, the plateau region appears to raise above the remaining portions of the GUI.

[0055] Following block 154, the method proceeds to block 156 where a determination is made as to whether or not features are located within the expanded area. The features may be buttons, web links, icons, user interface elements, data entry regions and/or the like.