

the presence of an object. The device may select an application to execute on the device (1105). The application may have functions which require certain gestures from a user in order to successfully interact with the application. Accordingly, the device may dynamically reconfigure the pixel size and/or shape of the panel for the selected application based on the expected gestures (1110).

[0070] To adjust the pixel size and/or shape, the panel may select particular portions of the panel in which to adjust the pixel size and/or shape. The portion may be the entire panel or any portion of the panel, such as the portion in which certain gestures are expected for the application. The device may adjust the pixel size and/or shape in the selected portion based on the application. The device may detect gestures (1115).

[0071] FIGS. 12a, 12b, and 12c are exemplary illustrations of a sensor panel dynamically reconfiguring sensor size and shape based on an application according to embodiments of the invention. FIGS. 12a, 12b, and 12c illustrate the method of FIG. 11. FIG. 12a shows an audio player application selected to execute on a device having sensor panel 1200. Icon 1205 may be displayed on panel 1200 to depict a scroll wheel. The application may require that an object select icon 1205 and perform a curving gesture parallel to panel 1200 in the vicinity of the icon in order to request rotation of the scroll wheel. FIG. 12b shows an initial pixel size and shape 1210 of panel 1200 and where icon 1205 would appear when the audio player application is selected. FIG. 12c shows smaller pixel size 1215 of panel 1200 where icon 1250 appears after the audio player application has been selected for execution. Here, pixel size 1210 may be decreased to smaller pixel size 1215 in the portion of the panel where the wheel portion of icon 1205 appears in order to detect the required curving gesture for rotating the scroll wheel. Pixel size 1210 may be increased to larger pixel size 1220 in the portion of the panel where the center of icon 1205 appears because the required curving gesture for rotating the scroll wheel is not expected in this portion of icon 1205. Pixel size 1210 may remain the same in the portions of the panel where icon 1205 does not appear because gestures may not be expected in these portions when the audio player application is executing.

[0072] In this example, the pixel shape is unchanged. However, in some embodiments, the pixel shape may be dynamically reconfigured to better detect the curving gesture, for example.

[0073] In another example, a menu pop-up application may require an object to select an item from the pop-up menu. This can require increasingly smaller pixel size as the object approaches the portion of the panel displaying the pop-up menu in order to sense when the object selects a particular menu item. This may also require a pixel shape corresponding to the display area of the pop-up menu.

[0074] In another example, a mouse rollover application may require an object to move around like a mouse input device. This can require a larger pixel size because it may not be necessary for the object to target a particular pixel, but a general area, such that the panel need not sense where the object may be targeting with high precision. This can also require a pixel shape capable of sensing the mouse rollover motion.

[0075] In another example, a computer wake-up application may require an object to make a motion indicative of a wake-up request. This can require a larger pixel size because sensing only a general or simple motion of the object may be

required to recognize a wake-up request. This can also require a pixel shape capable of sensing the wake-up motion.

[0076] In another example, an interactive game application may require multiple interactions with an object. This can require multiple pixel sizes of the panel at the same time or in sequence. For example, in a first portion of the panel, the application may require the object to select a start or stop button. In a second portion of the panel, the application may require the object to simulate a complex motion, e.g., a driving motion, a batting motion, or a drawing motion. In a third portion of the panel, the application may require the object to manipulate more complicated icons, buttons, or sliders. This can require a large pixel size in the first portion, a small pixel size in the second portion, and medium pixel size in the third portion, for example. This can also require multiple pixel shapes corresponding to the different interactions.

[0077] FIG. 13a illustrates exemplary mobile telephone 1336 that can include touch sensor panel 1324 and display device 1330, the touch sensor panel having dynamically reconfigurable sensor size and shape according to embodiments of the invention.

[0078] FIG. 13b illustrates exemplary digital media player 1340 that can include touch sensor panel 1324 and display device 1330, the touch sensor panel having dynamically reconfigurable sensor size and shape according to embodiments of the invention.

[0079] FIG. 13c illustrates exemplary personal computer 1344 that can include touch sensor panel (trackpad) 1324 and display 1330, the touch sensor panel and/or display of the personal computer (in embodiments where the display is part of a touch screen) having dynamically reconfigurable sensor size and shape according to embodiments of the invention.

[0080] The mobile telephone, media player, and personal computer of FIGS. 13a, 13b and 13c can provide improved gesture detection by dynamically reconfiguring sensor size and shape in sensor panels according to embodiments of the invention.

[0081] Generally, embodiments of the invention can be applicable to any devices that include sensor panels. The sensor panels can be, for example, single-touch panels, multi-touch panels, far-field proximity panels, near-field proximity panels, and combinations thereof. Single-touch panels may sense a single touch or proximity event at a time. Multi-touch panels may sense multiple touch or proximity events at a time. Far-field and near-field proximity panels may sense either a single or multiple touch or proximity events at a time.

[0082] Although the invention has been fully described in connection with embodiments thereof with reference to the accompanying drawings, it is to be noted that various changes and modifications will become apparent to those skilled in the art. Such changes and modifications are to be understood as being included within the scope of the invention as defined by the appended claims.

What is claimed is:

1. A method for dynamically reconfiguring sensor size and shape in a sensor panel, the sensor panel including a plurality of sensing pixels placed along the panel at a predetermined initial size and shape, the method comprising:
 - determining that an object is within a predetermined distance of the panel; and
 - dynamically reconfiguring at least one of the size or shape of the pixels based on the determination.
2. The method of claim 1, wherein the determining comprises: