electronic device **700**. In the preferred embodiments, electronic device **700** can already be equipped with a high-voltage circuit, such as those used to drive the backlight of an LCD display, which can also be used to provide (relatively) high voltage, low-current control signals for selectively activating the transparent piezoelectric actuators. In other embodiments, the control signals can be provided by a low-voltage, high-current driver circuit so long as the voltage applied to the piezoelectric actuator is sufficient to cause the piezoelectric material to change physical dimensions.

**[0061]** Bus **722** can provide a data transfer path for transferring data to, from, or between detection module **702**, processor **704**, display generation circuitry **706**, user interface **708**, tactile feedback circuitry **710**, communications circuitry **712**, memory **716**, storage **718**, input/output circuitry **720**, and any other component included in electronic device **700**.

**[0062]** FIGS. **8**A and **8**B show an exemplary simplified logical flow of an illustrative method of operation of circuitry in accordance with some embodiments of the present invention.

**[0063]** Process **800** starts at step **802** and proceeds to step **804**. At step **804**, an electronic device, such as a laptop or touchscreen device, is activated in response to, for example, the user pressing a power button, touching a touchpad, or opening a hinged screen. When the device activates, its input/output components, circuitry, etc., including any touch input component and/or visual display can also be activated.

**[0064]** At step **806**, the electronic device presents a visual display to the user, for example a logon display, a video playback display, an audio playback display, a notification display, a desktop display, or a menu display, or any other display such as, e.g., display **602** shown in FIG. **6**. The visual display may include icons, virtual buttons, hyperlinks, textboxes, and/or other user-selectable input elements.

**[0065]** In other embodiments, such as those implemented by devices without visual display screens, step **806** may be omitted. Dynamic, localized haptic feedback can be used with any type of surface and/or input component of any type of device, including devices without visual displays. Moreover, a device can enter a mode with active, dynamic, localized haptic feedback when the device's display screen is not functioning or in response to a user indicating a desire to use the device in a non-visual mode.

**[0066]** At step **808**, the device's processor analyzes the visual display for any user-selectable display elements such as, e.g., icons, virtual buttons, hyperlinks, textboxes, and/or other user-selectable input elements. Cartesian coordinates, for example, can be associated with each user-selectable display element identified in step **808** and can be stored in the memory of the electronic device. If the visual display does not any include user-selectable display elements, process **800** proceeds to step **810**.

**[0067]** At step **810**, the device waits for user input. At step **812**, the processor can compare the amount of time that has passed while waiting for a user input signal with a value stored in memory. If the time spent waiting exceeds the value, process **800** proceeds to end at step **814**. If the time spent waiting does not exceed the value, process **800** proceeds to step **816**.

**[0068]** At step **816**, the device determines whether a user input signal has been received. If a user input signal has been received, process **800** proceeds to step **806**. If a user input signal has not been received, process **800** returns to step **810**.

**[0069]** If the visual display does include user-selectable data elements, at step **818** the device determines the location (s), shape(s), size(s) and other attributes of user-selectable display elements.

**[0070]** At step **820**, the device associates vibrational characteristics with each user-selectable display element. For example, the processor may retrieve from memory vibrational characteristics associated with each user-selectable display element. A user-selectable display element may have no vibrational characteristics. The vibrational characteristics associated with each user-selectable display element may also include vibrational characteristics for the empty space near the user-selectable display element, such as, e.g., empty space **620** around virtual scroll wheel **612** shown in FIG. **6**. In some embodiments, the empty space (i.e., areas of the visual display other than user-selectable display elements) may be associated with vibrational characteristics. In some embodiments, the vibrational characteristics can be associated with a user input signal (e.g., a touch event, when generated by a touch-based input component). In such an embodiment, power is conserved by vibrating the device, or a portion of the device, only when the touch event is occurring. In other embodiments, the device, or a portion of the device can vibrate continuously while the display is being presented. In either embodiment, the quantity, types, locations, shapes and sizes of user-selectable display elements can change as the visual display presented by electronic device changes. Thus, one visual display may be distinguished from another by the different combination of vibrational characteristics associated with the user-selectable display elements of the two visual displays.

**[0071]** At step **822**, a user interface component or device, such as a touchscreen or touchpad, monitors for user input (such as, e.g., a touch event).

**[0072]** At step **824**, the processor can compare the amount of time that has passed while waiting for a user input signal with a value stored in memory. If the amount of time that has passed exceeds the value, the process ends at step **814**. For example, process **800** may end by powering down the electronic device, putting the electronic device into a "sleep" state, or locking (or temporarily disabling) the user interface hardware to prevent unintentional user input.

**[0073]** At step **826**, the user input components can detect different kinds of user inputs. For example, a proximity sensor can detect a user's finger hovering in close proximity to the surface of, e.g., a touchscreen. A touchscreen may also detect a user's finger pressing on the surface of the touchscreen. A touchscreen may also detect a user's finger dragging across the surface of the touchscreen. When any of the user component's hardware and/or software detect any or a particular user input, process **800** proceeds to step **828**.

**[0074]** At step **828**, the user input component can generate a corresponding data signal that is sent to, e.g., the electronic device's processor. For example, a touch event can cause the touchscreen to generate a touch signal, which the processor can respond to. The signal can include data that identifies, for example, the type of user input (e.g., tap, slide, press, pinch, etc.), the location or locations of user input, etc.

**[0075]** At step **830**, the processor can analyze an input signal (e.g., a touch signal when generated by a touchscreen input component) and determine, for example, whether the location, type, etc. of the input signal is associated with vibrational characteristics. For example, in a touchscreen device, Cartesian coordinates can be associated with a user-select-