back during a push button event. For example, the actuators can be configured to provide a vibration or click. They can also provide a bias force, which the user can press against in order to activate the button.

**[0133]** FIG. **17** illustrates an exemplary method for changing the topography of a user interface of a touch screen according to embodiments of the invention. In the example of FIG. **17**, a determination can be made about whether an input has been received (**171**). The input can be from a user of a touch sensitive device. For example, the user can input a request to form a particular user interface. The input can also be a touch or near touch on the user interface surface. The input can also be from an application running on the device. For example, a telephone application running on the device can input a command to form a telephone user interface. The input can also be from the device itself. For example, upon powering up, a device can input a command to form a user interface for that particular device type.

**[0134]** Based on the input, a user interface state can be obtained for a user interface surface having a plurality of nodes with at least display, touch sensing, and shape changeable capabilities (**172**). For example, if a user inputs a request for a keypad, the user interface state can be obtained that indicates a user interface with a keypad should be formed. If a scroll wheel application starts running, the user interface state can be obtained that indicates a user interface with a scroll wheel should be formed. If the device is turned on as a media player, the user interface state can be obtained that indicates a user interface with audio buttons should be formed.

**[0135]** According to the user interface state, a selectable user interface element can be displayed on one or more of the nodes (**173**). Concurrent therewith, the shape of the one or more nodes associated with the user interface element can be physically altered (**174**). For example, for a keypad state, the user interface nodes can raise above the initial user interface surface to form push buttons and the numbers 0-9 can be displayed on the push buttons to be selected by the user. The one or more nodes can be monitored for a touch or near touch as an input to cause the device to perform an operation associated with the nodes (**175**).

**[0136]** FIG. **18** illustrates an exemplary touch sensing device that can change topography according to embodiments of the invention. The touch sensing device **180** can generally be configured to sense touches or near touches about a surface in order to provide inputs to a host device. The inputs can for example be used to operate a graphical user interface presented on display **185** of a host device. The touch sensing device **180** can include a touch pad, for example. The touch pad can be integrated within the host device as shown. Alternatively, the touch pad can be a separate mechanism in communication with the host device. When integrated, the touch sensing device **180** can be mounted within a housing of the host device or in some cases can be provided integrally with a portion of the host device as for example the housing or outer layer (e.g., skin) of the host device. The host device can be widely varied, and can generally correspond to any consumer electronic product. In some embodiments, the touch pad can be suitable for use in portable electronic devices and more particularly handheld electronic devices such as mice, cell phones and media players. In one example, the touch pad can be included in any of those media players manufactured by Apple Inc. of Cupertino Calif. (e.g., iPod™).

**[0137]** In the example of FIG. **18**, the touch sensing device **180** can include shape changeable surface **181** having a plurality of shape changeable nodes **182**. The shape changeable nodes can be configured to be deformable points or regions of the surface in order to affect the topography change at the surface. As shown in FIG. **18**, the touch sensing device can include an upper unbroken, continuous surface, with no cracks or spaces between nodes. The nodes **182** can be integrated into the surface. As such, the nodes **182** can be hidden from view (as shown by the dotted lines). The nodes can be arranged in a variety of orientations. In the illustrated embodiment, the nodes can be positioned in a matrix of rows and columns. Each node can form a pixel capable of altering the surface of the touch sensing device in a non-trivial manner. The nodes can be activated singularly or in combination to form a variety of three-dimensional shapes about the surface. The arrangement of the surface can be flat (as shown) or angled, curved, or otherwise formed. In essence, the state of the surface can take any form. The nodes can be configured in a variety of ways. In one example, the surface can include a deformable layer that can be deformed by a plurality of actuators forming the nodes. The actuators can be separate from or integrated with the deformable layer. In some cases, the deformable layer and the actuators can be all in one (e.g., same material).

**[0138]** In one embodiment, various user interface states can be created by adjusting the topography of the touch sensing device surface. This can be for example accomplished by deforming some areas while leaving other areas undeformed (e.g., selectively deforming the touch surface). Generally speaking, raised and lowered portions can be created among level areas, thereby creating different physical layouts that can provide variable tactile feels and looks at the touch surface.

**[0139]** FIG. **19** illustrates an exemplary touch sensing device having a user interface that can change topography to form a scroll wheel according to embodiments of the invention. In the example of FIG. **19**, touch sensing device **190** can have a desired user interface state in which the user interface can form scroll wheel **193**. As such, shape changeable nodes (such as nodes **182** of FIG. **18**) located where the scroll wheel **193** should be can be raised and/or lowered on the surface **191**, thereby informing the user of the location of the scroll wheel to be touched. The shape changeable nodes forming center button **193**-*b* can be raised and shape changeable nodes forming surrounding circle **193**-*a* can be lowered. In some embodiments, the shape changeable nodes forming the boundaries of the scroll wheel outer and inner circles can be raised to inform the user that the outer and inner circle areas can be active for touching. In some embodiments, the shape changeable nodes forming the interior of the inner circle can be raised to one level and the remaining interior of the outer circle can be raised to another level to inform the user that these raised areas can be active for touching. In some embodiments, touch sensing pixels corresponding to the unaltered areas of the surface, e.g., the nodes outside the outer circle, can be deactivated to form a null touch region of the touch sensing device or, conversely, only the touch sensing pixels corresponding to the altered areas of the surface can be activated to form an active touch region of the touch sensing device. A computing system can have functions associated with the scroll wheel **193** that can execute when the user