

ciated with a texture. For example, in one embodiment, one or more of the turns along route **1204** may be associated with a texture. In another embodiment, one or more waypoints along route **1204** may be associated with a texture.

**[0105]** In some embodiments, messaging device **1202** may comprise more than one actuator, as described herein in relation to system **500**.

**[0106]** FIG. **13** is an illustration of a system for using textures in graphical user interface widgets according to one embodiment of the present invention. FIG. **13** comprises a system **1300**, which is similar to system **500** above. As shown in FIG. **13**, messaging device **1302** comprises a display **1316** positioned underneath a touch-sensitive interface. In some embodiments (not shown in FIG. **13**), system **1300** may further comprise a manipulandum, such as a mouse, scroll wheel, or roller ball, which allows the user to interact with the graphical user interface on display **1316**.

**[0107]** As shown in FIG. **13**, display **1316** comprises a page for a social networking application. Display **1316** further comprises picture box **1304**, name box **1306**, status box **1308**, and texture **1310**. Picture box **1304** is configured to allow the user to post a picture on his/her social networking page. In the embodiment shown in FIG. **13**, the user has either not posted picture, or protected the social page such that users not in the user's network cannot access picture box **1304**. Name box **1306** is configured to allow the users to post their name, or some other identifying characteristic. In the embodiment shown in FIG. **13**, name box **1306** comprises the text "John Doe's Social Page." In other embodiments, the user could post additional information, for example, political affiliation, contact information, gender, or relationship status. Status box **1308** is configured to allow the user or the user's friends to post status updates to the user's social networking page. In some embodiments these updates may comprise textual updates, image updates, video updates, or texture updates. In the embodiment shown in FIG. **13**, status update box **1308** comprises two updates. First it comprises the textual update "John Doe is ready for the weekend." Second it comprises texture update **1310**.

**[0108]** Messaging device **1302** further comprises an actuator (not shown in FIG. **13**) configured to output a haptic effect configured to simulate a texture. In some embodiments, the user can feel this texture on the surface of display **1316**. For example, in the embodiment shown in FIG. **13**, texture update **1310** comprises the texture of wooden boards. When the user, or a visitor to the user's social networking page touches texture update **1310**, messaging device **1302** will output a haptic effect configured to simulate the texture of wooden boards. In other embodiments, the texture update **1310** may comprise a different texture, for example, the texture of oil, sand, water, grass, fur, skin, lizard skin, leather, sandpaper, bricks, or rocks. In some embodiments, users may post textures associated with their current mood to their own social networking page. In other embodiments, users may post textures to friends' pages as gifts or messages to their friends. In still other embodiments, users may associate textures with other portions of social networking pages. For example, in some embodiments, users may post textures to pictures, messages, status, or some other section of social networking pages.

**[0109]** In some embodiments, messaging device **1302** may comprise more than one actuator, as described herein in relation to system **500**.

#### Advantages of Systems and Methods for Using Textures in Graphical User Interface Widgets

**[0110]** There are many advantages of systems and methods for using textures in graphical user interface widgets. For

example, systems and methods for using textures in graphical user interface widgets adds a previously unused haptic effect to a mobile device. This new effect provides a new avenue for the user to receive information from the device, without the user having to look at the device's display. For example, systems and methods for using textures in graphical user interface widgets may allow the user to assign different textures to different icons, buttons, or other components of their display. Thus, users may be able to determine which icon they are touching, without having to look at that icon. This may increase usability of the device, and may make a device more useful to the visually impaired. It may also increase the adoption of different types of applications that had not previously been utilized by users that often use mobile devices in distracting situations, such as while walking or driving.

**[0111]** Further, systems and methods for using textures in graphical user interface widgets may provide the user with more information, without distracting the user from other tasks. Therefore, it may reduce the likelihood of user error. For example, users will be less likely to hit the wrong icon or press the wrong key if they are utilizing systems and methods for using textures in graphical user interface widgets. This functionality may serve both to increase user satisfaction and increase the adoption rate for technology that incorporates systems and methods for using textures in graphical user interface widgets.

#### General Considerations

**[0112]** The use of "adapted to" or "configured to" herein is meant as open and inclusive language that does not foreclose devices adapted to or configured to perform additional tasks or steps. Additionally, the use of "based on" is meant to be open and inclusive, in that a process, step, calculation, or other action "based on" one or more recited conditions or values may, in practice, be based on additional conditions or values beyond those recited. Headings, lists, and numbering included herein are for ease of explanation only and are not meant to be limiting.

**[0113]** Embodiments in accordance with aspects of the present subject matter can be implemented in digital electronic circuitry, in computer hardware, firmware, software, or in combinations of the preceding. In one embodiment, a computer may comprise a processor or processors. The processor comprises or has access to a computer-readable medium, such as a random access memory (RAM) coupled to the processor. The processor executes computer-executable program instructions stored in memory, such as executing one or more computer programs including a sensor sampling routine, a haptic effect selection routine, and suitable programming to produce signals to generate the selected haptic effects as noted above.

**[0114]** Such processors may comprise a microprocessor, a digital signal processor (DSP), an application-specific integrated circuit (ASIC), field programmable gate arrays (FPGAs), and state machines. Such processors may further comprise programmable electronic devices such as PLCs, programmable interrupt controllers (PICs), programmable logic devices (PLDs), programmable read-only memories (PROMs), electronically programmable read-only memories (EPROMs or EEPROMs), or other similar devices.

**[0115]** Such processors may comprise, or may be in communication with, media, for example tangible computer-readable media, that may store instructions that, when executed by the processor, can cause the processor to perform