

SYSTEMS AND METHODS FOR A TEXTURE ENGINE

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This patent application claims priority to U.S. Provisional Patent Application No. 61/159,482, entitled "Locating Features Using a Friction Display," filed Mar. 12, 2009, which is incorporated by reference herein in its entirety.

[0002] This patent application claims priority to: U.S. Provisional Patent Application No. 61/262,041, entitled "System and Method for Increasing Haptic Bandwidth in an Electronic Device," filed Nov. 17, 2009, which is incorporated by reference herein in its entirety.

[0003] This patent application claims priority to U.S. Provisional Patent Application No. 61/262,038, entitled "Friction Rotary Device for Haptic Feedback," filed Nov. 17, 2009, which is incorporated by reference herein in its entirety.

[0004] This patent application is related to U.S. patent application Ser. No. _____, filed the same day as the present application and entitled "Systems and Methods for Using Multiple Actuators to Realize Textures," (Attorney Docket No. IMM355 (51851-383719)), which is incorporated by reference herein in its entirety.

[0005] This patent application is related to U.S. patent application Ser. No. _____, filed the same day as the present application and entitled "Systems and Methods for Using Textures in Graphical User Interface Widgets," (Attorney Docket No. IMM356 (51851-383718)), which is incorporated by reference herein in its entirety.

[0006] This patent application is related to U.S. patent application Ser. No. _____, filed the same day as the present application and entitled "Systems and Methods for Providing Features in a Friction Display," (Attorney Docket No. IMM357 (51851-383714)), which is incorporated by reference herein in its entirety.

[0007] This patent application is related to U.S. patent application Ser. No. _____, filed the same day as the present application and entitled "Systems and Methods for Friction Displays and Additional Haptic Effects," (Attorney Docket No. IMM358 (51851-383716)), which is incorporated by reference herein in its entirety.

[0008] This patent application is related to U.S. patent application Ser. No. _____, filed the same day as the present application and entitled "Systems and Methods for Interfaces Featuring Surface-Based Haptic Effects," (Attorney Docket No. IMM359 (51851-383715)), which is incorporated by reference herein in its entirety.

FIELD OF THE INVENTION

[0009] The present invention generally relates to haptic feedback and more particularly to systems and methods for a texture engine.

BACKGROUND

[0010] Over the past several years, the use of handheld devices of all types has grown exponentially. These devices are used as portable organizers, telephones, music players, and gaming systems. Many modern handheld devices now incorporate some type of haptic feedback. As haptic technol-

ogy improves, devices may incorporate haptic feedback simulating a texture. Accordingly, a haptic texture engine is needed.

SUMMARY

[0011] Embodiments of the present invention provide systems and methods for a texture engine. For example, in one embodiment, a system for a texture engine comprises: a processor configured to receive a display signal comprising a plurality of pixels, determine a haptic effect comprising a texture, and transmit a haptic signal associated with the haptic effect to an actuator in communication with the processor, the actuator configured to receive the haptic signal and output the haptic effect.

[0012] This illustrative embodiment is mentioned not to limit or define the invention, but rather to provide an example to aid understanding thereof. Illustrative embodiments are discussed in the Detailed Description, which provides further description of the invention. Advantages offered by various embodiments of this invention may be further understood by examining this specification.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] These and other features, aspects, and advantages of the present invention are better understood when the following Detailed Description is read with reference to the accompanying drawings, wherein:

[0014] FIG. 1 is a block diagram of a system for a texture engine according to one embodiment of the present invention;

[0015] FIG. 2 is an illustration of a system for a texture engine according to one embodiment of the present invention;

[0016] FIG. 3a is an illustration of a system for a texture engine according to one embodiment of the present invention;

[0017] FIG. 3b is an illustration of a system for a texture engine according to one embodiment of the present invention;

[0018] FIG. 4 is a flow chart of a method for a texture engine according to one embodiment of the present invention;

[0019] FIG. 5a is an illustration of one of the textures that a texture engine may generate according to one embodiment of the present invention;

[0020] FIG. 5b is another illustration of one of the textures that a texture engine may generate according to one embodiment of the present invention;

[0021] FIG. 5c is another illustration of one of the textures that a texture engine may generate according to one embodiment of the present invention;

[0022] FIG. 5d is another illustration of one of the textures that a texture engine may generate according to one embodiment of the present invention;

[0023] FIG. 5e is another illustration of one of the textures that a texture engine may generate according to one embodiment of the present invention;

[0024] FIG. 5f is another illustration of one of the textures that a texture engine may generate according to one embodiment of the present invention;

[0025] FIG. 5g is another illustration of one of the textures that a texture engine may generate according to one embodiment of the present invention; and