

pixel data for use by a flexible visual display layer of a display and piston data for use by a tactile display layer of the display, the tactile display layer having a effective core area corresponding to an ineffective area of a touch sensitive layer of the display. 5

26. The method of claim 25, wherein said generating comprises generating a plurality of pixel and piston data for said tactilely enhanced visual image to be rendered, based at least in part on an image specification specifying said tactilely enhanced visual image to be rendered. 10

27. The method of claim 26, wherein the image specification comprises
 an identification of the visual image to be rendered; and one or more tactile attribute specifications specifying one or more tactile attributes for tactile enhancements of the rendered visual image. 15

28. The method of claim 27, wherein the tactile attributes comprise at least a selected one of a tactile pin height attribute, a tactile pin pattern attribute, and a tactile pin hardness attribute. 20

29. The method of claim 27, wherein the tactile attributes comprise at least two of a tactile pin height attribute, a tactile pin pattern attribute, and a tactile pin hardness attribute.

30. The method of claim 27, wherein the tactile attributes comprise a tactile pin height attribute, a tactile pin pattern attribute, and a tactile pin hardness attribute. 25

31. The method of claim 25, wherein the method further comprises:
 rendering the visual image on the flexible visual display layer using the generated pixel data; and
 if the visual image rendered is to be tactilely enhanced, tactilely enhancing at least a portion of the rendered visual image on the effective core area of the tactile display layer using the generated piston data. 30

32. An apparatus comprising:
 display means for displaying tactilely enhanced visual images and for detecting contact with the displayed tactilely enhanced visual images;
 first control means for controlling selective activation/deactivation of pixels to facilitate rendering of visual images, the first control means controlling selective activation/deactivation of pixels to be made on a flexible visual display layer of the display; and
 second control means for controlling complementary selective tactile enhancements of selected ones of the rendered visual images, the second control means controlling selective tactile enhancements to be made on an effective core area of a tactile display layer of the display, the effective core area corresponding to an ineffective area of a touch sensitive layer of the display. 45

33. An article of manufacture comprising:
 a storage medium having a plurality of programming instructions stored therein, the plurality of programming instructions adapted to program an apparatus to receive a request for a graphics operation to render a tactilely enhanced visual image;
 determine if the visual image is to be tactilely enhanced; and
 if the visual image is to be tactilely enhanced, generate in response, a plurality of pixel and piston data for said tactilely enhanced visual image to be rendered, the pixel data for use by a flexible visual display layer of a display and the piston data for use by a tactile display layer of the display, the tactile display layer having a effective core area corresponding to an ineffective area of a touch sensitive layer of the display.

34. The article of claim 33, wherein the programming instructions are further adapted to program an apparatus to generate a plurality of pixel and piston data, and the generating comprises generating a plurality of pixel and piston data for said tactilely enhanced visual image to be rendered, based at least in part on an image specification specifying said tactilely enhanced visual image to be rendered.

35. The article of claim 34, wherein the image specification comprises:
 an identification of the visual image to be rendered; and one or more tactile attribute specifications specifying one or more tactile attributes for tactile enhancements of the rendered visual image. 30

36. The article of claim 35, wherein the tactile attributes comprise at least a selected one of a tactile pin height attribute, a tactile pin pattern attribute, and a tactile pin hardness attribute.

37. The article of claim 35, wherein the tactile attributes comprise at least two of a tactile pin height attribute, a tactile pin pattern attribute, and a tactile pin hardness attribute. 35

38. The article of claim 35, wherein the tactile attributes comprise a tactile pin height attribute, a tactile pin pattern attribute, and a tactile pin hardness attribute. 40

39. The article of claim 33, wherein the programming instructions are further adapted to program an apparatus to render the visual image on the flexible visual display layer using the generated pixel data; and
 if the visual image rendered is to be tactilely enhanced, tactilely enhance at least a portion of the rendered visual image on the effective core area of the tactile display layer using the generated piston data.

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