CLAIMS

1. A method of managing multilayer controls of a mobile computing device having one or more touch sensors, the method comprising:

receiving, by a processor of the mobile computing device, an input at a mobile computing device for performing a function with respect to content at the mobile device, wherein the content at the mobile device is segmented into at least a first command layer having one or more objects and a second command layer having one or more objects;

determining whether the received input is associated with a first object of the first command layer or a second object of the second command layer;

determining a function to be performed on the first object of the first command layer or the second object of the second command layer based on whether the first command layer or the second command layer is determined to be associated with the received input; and

performing the determined function on the first object or the second object.

2. The method of claim 1, wherein receiving, by the processor of the mobile computing device, the input at the mobile computing device for performing a function with respect to content at the mobile device comprises receiving the input at one of the touch sensors of the mobile computing device for performing a function with respect to content at the mobile device.

3. The method of claim 1, further comprising:

obtaining a command layer translation table from a memory of the mobile computing device; and

determining a touch sensor at which the input was received;

wherein determining the function to be performed on the first object of the first command layer or the second object of the second command layer comprises determining the function associated with the received input and the associated command layer based on the determined touch sensor using the translation table.

4. The method of claim 1, wherein:

the first command layer comprises a first image layer of an image displayed by the

mobile device, and the second command layer comprises a second image layer of the displayed image; and

performing the determined function on the first object or the second object comprises performing the determined function on an element of the first image layer or on an element of the second image layer.

5. The method of claim 1, wherein:

the first command layer comprises a foreground layer of an image displayed by the mobile device, and the second command layer comprises a background layer of the displayed image; and

performing the determined function on the first object or the second object comprises performing the determined function on an element of the foreground layer or on an element of the background layer.

6. The method of claim 1, wherein:

the first command layer comprises a first dimension of an image displayed by the mobile device, and the second command layer comprises a second dimension of the displayed image; and

performing the determined function on the first object or the second object comprises performing the determined function on the first dimension of the image or on the second dimension of the image.

7. The method of claim 1, wherein:

the first command layer comprises a first text layer of text displayed by the mobile device, and the second command layer comprises a second text layer of the displayed text; and

performing the determined function on the first object or the second object comprises performing the determined function on an element of the first text layer or on an element of the second text layer.

8. The method of claim 1, wherein:

the first command layer comprises a processor-generated image layer of digital objects in

an extended reality image displayed by the mobile device, and the second command layer comprises a real image layer of real objects displayed in the displayed extended reality image; and

performing the determined function on the first object or the second object comprises performing the determined function on an extended reality image element within the first extended reality image layer or on a real element within the real image layer.

9. The method of claim 1, wherein:

the first command layer comprises a first application executing on the mobile device, and the second command layer comprises a second application executing on the mobile device; and

performing the determined function on the first object or the second object comprises sending an instruction to perform the determined function to the first application or the second application.

10. The method of claim 1, wherein:

the first command layer comprises a representation of a first device configured to receive commands from the mobile computing device, and the second command layer comprises a representation of a second device configured to receive commands from the mobile computing device; and

performing the determined function on the first object or the second object comprises sending an instruction to perform the determined function to the first device or the second device.

11. The method of claim 1, wherein a first group of the one or more touch sensors disposed substantially on a front of the mobile computing device is mapped to the first command layer, and a second group of the one or more touch sensors disposed substantially on a back of the mobile computing device is mapped to the second command layer.

12. The method of claim 11, wherein the received input is one of two or more inputs received by the processor at overlapping times from one of the touch sensors of the first group and one of the touch sensors of the second group.

13. The method of claim 11, wherein a third group of the one or more touch sensors disposed substantially on a side of the mobile computing device is mapped to one or more of the first command layer and the second command layer.

14. The method of claim 13, wherein the received input is one of two or more inputs received by the processor at overlapping times from one of the touch sensors of the third group and a touch sensor from among the first group and the second group.

15. A mobile computing device, comprising:

one or more touch sensors;

a memory; and

a processor coupled to the one or more touch sensors and the memory, and configured with processor-executable instructions to perform operations comprising:

receiving an input for performing a function with respect to content, wherein the content is segmented into at least a first command layer having one or more objects and a second command layer having one or more objects;

determining whether the received input is associated with a first object of the first command layer or a second object of the second command layer;

determining a function to be performed on the first object of the first command layer or the second object of the second command layer based on whether the first command layer or the second command layer is determined to be associated with the received input; and

performing the determined function on the first object or the second object.

16. The mobile computing device of claim 15, wherein the processor is configured with processor-executable instructions to perform operations such that receiving the input at the mobile computing device for performing a function with respect to content at the mobile device comprises receiving the input at one of the touch sensors of the mobile computing device for performing a function with respect to content at the mobile device.

17. The mobile computing device of claim 15, wherein the processor is configured with processor-executable instructions to perform operations further comprising:

obtaining a command layer translation table from the memory; and

determining a touch sensor at which the input was received,

wherein the processor is configured with processor-executable instructions to perform operations such that determining a function to be performed on the first object of the first command layer or the second object of the second command layer comprises determining the function associated with the received input and the associated command layer based on the determined touch sensor using the translation table.

18. The mobile computing device of claim 15, wherein the processor is configured with processor-executable instructions to perform operations such that:

the first command layer comprises a first image layer of an image displayed by the mobile device, and the second command layer comprises a second image layer of the displayed image; and

performing the determined function on the first object or the second object comprises performing the determined function on an element of the first image layer or on an element of the second image layer.

19. The mobile computing device of claim 15, wherein the processor is configured with processor-executable instructions to perform operations such that:

the first command layer comprises a foreground layer of an image displayed by the mobile device, and the second command layer comprises a background layer of the displayed image; and

performing the determined function on the first object or the second object comprises performing the determined function on an element of the foreground layer or on an element of the background layer.

20. The mobile computing device of claim 15, wherein the processor is configured with processor-executable instructions to perform operations such that:

the first command layer comprises a first dimension of an image displayed by the mobile

device, and the second command layer comprises a second dimension of the displayed image; and

performing the determined function on the first object or the second object comprises performing the determined function on an element of the foreground layer or on an element of the background layer.

21. The mobile computing device of claim 15, wherein the processor is configured with processor-executable instructions to perform operations such that:

the first command layer comprises a first text layer of text displayed by the mobile device, and the second command layer comprises a second text layer of the displayed text; and

performing the determined function on the first object or the second object comprises performing the determined function on an element of the first text layer or on an element of the second text layer.

22. The mobile computing device of claim 15, wherein the processor is configured with processor-executable instructions to perform operations such that:

the first command layer comprises a processor-generated image layer of digital objects in an extended reality image displayed by the mobile device, and the second command layer comprises a real image layer of real objects displayed in the displayed extended reality image; and

performing the determined function on the first object or the second object comprises performing the determined function on an extended reality image element within the first extended reality image layer or on a real element within the real image layer.

23. The mobile computing device of claim 15, wherein the processor is configured with processor-executable instructions to perform operations such that:

the first command layer comprises a first application executing on the mobile device, and the second command layer comprises a second application executing on the mobile device; and

performing the determined function on the first object or the second object comprises sending an instruction to perform the determined function to the first application or the second application.

24. The mobile computing device of claim 15, wherein the processor is configured with processor-executable instructions to perform operations such that:

the first command layer comprises a representation of a first device configured to receive commands from the mobile computing device, and the second command layer comprises a representation of a second device configured to receive commands from the mobile computing device; and

performing the determined function on the first object or the second object comprises sending an instruction to perform the determined function to the first device or the second device.

25. The mobile computing device of claim 15, wherein the processor is configured with processor-executable instructions to perform operations such that a first group of the one or more touch sensors disposed substantially on a front of the mobile computing device is mapped to the first command layer, and a second group of the one or more touch sensors disposed substantially on a back of the mobile computing device is mapped to the second command layer.

26. The mobile computing device of claim 25, wherein the received input is one of two or more inputs received by the processor at overlapping times from one of the touch sensors of the first group and one of the touch sensors of the second group.

27. The mobile computing device of claim 25, wherein the processor is configured with processor-executable instructions to perform operations such that a third group of the one or more touch sensors disposed substantially on a side of the mobile computing device is mapped to one or more of the first command layer and the second command layer.

28. The mobile computing device of claim 27, wherein the received input is one of two or more inputs received by the processor at overlapping times from one of the touch sensors of the third group and a touch sensor from among the first group and the second group.

29. A non-transitory processor-readable storage medium having stored thereon processor-

executable instructions configured to cause a processor of a mobile computing device having one or more touch sensors to perform operations for managing multilayer controls of the mobile computing device, comprising:

receiving an input for performing a function with respect to content, wherein the content is segmented into at least a first command layer having one or more objects and a second command layer having one or more objects;

determining whether the received input is associated with a first object of the first command layer or a second object of the second command layer;

determining a function to be performed on the first object of the first command layer or the second object of the second command layer based on whether the first command layer or the second command layer is determined to be associated with the received input; and

performing the determined function on the first object or the second object.

30. The non-transitory processor-readable storage medium of claim 29, wherein the stored processor-executable instructions are configured to cause the processor of the mobile device to perform operations such that receiving the input for performing a function with respect to content comprises receiving the input at one of the touch sensors of the mobile computing device.

31. The non-transitory processor-readable storage medium of claim 29, wherein the stored processor-executable instructions are configured to cause the processor of the mobile device to perform operations further comprising:

obtaining a command layer translation table from a memory of the mobile computing device; and

determining a touch sensor at which the input was received;

wherein the stored processor-executable instructions are configured to cause the processor of the mobile device to perform operations such that determining a function to be performed on the first object of the first command layer or the second object of the second command layer comprises determining the function associated with the received input and the associated command layer based on the determined touch sensor using the translation table.

32. The non-transitory processor-readable storage medium of claim 29, wherein the stored

processor-executable instructions are configured to cause the processor of the mobile device to perform operations such that:

the first command layer comprises a first image layer of an image displayed by the mobile device, and the second command layer comprises a second image layer of the displayed image; and

performing the determined function on the first object or the second object comprises performing the determined function on an element of the first image layer or on an element of the second image layer.

33. The non-transitory processor-readable storage medium of claim 29, wherein the stored processor-executable instructions are configured to cause the processor of the mobile device to perform operations such that:

the first command layer comprises a foreground layer of an image displayed by the mobile device, and the second command layer comprises a background layer of the displayed image; and

performing the determined function on the first object or the second object comprises performing the determined function on an element of the foreground layer or on an element of the background layer.

34. The non-transitory processor-readable storage medium of claim 29, wherein the stored processor-executable instructions are configured to cause the processor of the mobile device to perform operations such that:

the first command layer comprises a first dimension of an image displayed by the mobile device, and the second command layer comprises a second dimension of the displayed image; and

performing the determined function on the first object or the second object comprises performing the determined function on the first dimension of the image or on the second dimension of the image.

35. The non-transitory processor-readable storage medium of claim 29, wherein the stored processor-executable instructions are configured to cause the processor of the mobile device to

perform operations such that:

the first command layer comprises a first text layer of text displayed by the mobile device, and the second command layer comprises a second text layer of the displayed text; and

performing the determined function on the first object or the second object comprises performing the determined function on an element of the first text layer or on an element of the second text layer.

36. The non-transitory processor-readable storage medium of claim 29, wherein the stored processor-executable instructions are configured to cause the processor of the mobile device to perform operations such that:

the first command layer comprises a processor-generated image layer of digital objects in an extended reality image displayed by the mobile device, and the second command layer comprises a real image layer of real objects displayed in the displayed extended reality image; and

performing the determined function on the first object or the second object comprises performing the determined function on an extended reality image element within the first extended reality image layer or on a real element within the real image layer.

37. The non-transitory processor-readable storage medium of claim 29, wherein the stored processor-executable instructions are configured to cause the processor of the mobile device to perform operations such that:

the first command layer comprises a first application executing on the mobile device, and the second command layer comprises a second application executing on the mobile device; and

performing the determined function on the first object or the second object comprises sending an instruction to perform the determined function to the first application or the second application.

38. The non-transitory processor-readable storage medium of claim 29, wherein the stored processor-executable instructions are configured to cause the processor of the mobile device to perform operations such that:

the first command layer comprises a representation of a first device configured to receive

commands from the mobile computing device, and the second command layer comprises a representation of a second device configured to receive commands from the mobile computing device; and

performing the determined function on the first object or the second object comprises sending an instruction to perform the determined function to the first device or the second device.

39. The non-transitory processor-readable storage medium of claim 29, wherein the stored processor-executable instructions are configured to cause the processor of the mobile device to perform operations such that a first group of the one or more touch sensors disposed substantially on a front of the mobile computing device is mapped to the first command layer, and a second group of the one or more touch sensors disposed substantially on a back of the mobile computing device is mapped to the second command layer.

40. The non-transitory processor-readable storage medium of claim 39, wherein the received input is one of two or more inputs received by the processor at overlapping times from one of the touch sensors of the third group and a touch sensor from among the first group and the second group.

41. The non-transitory processor-readable storage medium of claim 39, wherein the stored processor-executable instructions are configured to cause the processor of the mobile device to perform operations such that a third group of the one or more touch sensors disposed substantially on a side of the mobile computing device is mapped to one or more of the first command layer and the second command layer.

42. The non-transitory processor-readable storage medium of claim 41, wherein the received input is one of two or more inputs received by the processor at overlapping times from one of the touch sensors of the third group and a touch sensor from among the first group and the second group.

43. A mobile computing device, comprising:

one or more touch sensors;

means for receiving an input for performing a function with respect to content, wherein the content at the mobile device is segmented into at least a first command layer having one or more objects and a second command layer having one or more objects;

means for determining whether the received input is associated with a first object of the first command layer or a second object of the second command layer;

means for determining a function to be performed on the first object of the first command layer or the second object of the second command layer based on whether the first command layer or the second command layer is determined to be associated with the received input; and

means for performing the determined function on the first object or the second object.

44. The mobile computing device of claim 43, wherein means for receiving the input at the mobile computing device for performing a function with respect to content comprises means for receiving the input at one of the touch sensors.

45. The mobile computing device of claim 43, further comprising:

means for obtaining a command layer translation table from a memory of the mobile computing device; and

means for determining a touch sensor at which the input was received;

wherein means for determining a function to be performed on the first object of the first command layer or the second object of the second command layer comprises means for determining the function associated with the received input and the associated command layer based on the determined touch sensor using the translation table.

46. The mobile computing device of claim 43, wherein:

the first command layer comprises a first image layer of an image displayed by the mobile device, and the second command layer comprises a second image layer of the displayed image; and

means for performing the determined function on the first object or the second object comprises means for performing the determined function on an element of the first image layer or on an element of the second image layer.

47. The mobile computing device of claim 43, wherein:

the first command layer comprises a foreground layer of an image displayed by the mobile device, and the second command layer comprises a background layer of the displayed image; and

means for performing the determined function on the first object or the second object comprises means for performing the determined function on an element of the foreground layer or on an element of the background layer.

48. The mobile computing device of claim 43, wherein:

the first command layer comprises a first dimension of an image displayed by the mobile device, and the second command layer comprises a second dimension of the displayed image; and

means for performing the determined function on the first object or the second object comprises means for performing the determined function on the first dimension of the image or on the second dimension of the image.

49. The mobile computing device of claim 43, wherein:

the first command layer comprises a first text layer of text displayed by the mobile device, and the second command layer comprises a second text layer of the displayed text; and

means for performing the determined function on the first object or the second object comprises means for performing the determined function on an element of the first text layer or on an element of the second text layer.

50. The mobile computing device of claim 43, wherein:

the first command layer comprises a processor-generated image layer of digital objects in an extended reality image displayed by the mobile device, and the second command layer comprises a real image layer of real objects displayed in the displayed extended reality image; and

means for performing the determined function on the first object or the second object comprises means for performing the determined function on an extended reality image element

within the first extended reality image layer or on a real element within the real image layer.

51. The mobile computing device of claim 43, wherein:

the first command layer comprises a first application executing on the mobile device, and the second command layer comprises a second application executing on the mobile device; and

means for performing the determined function on the first object or the second object comprises means for sending an instruction to perform the determined function to the first application or the second application.

52. The mobile computing device of claim 43, wherein:

the first command layer comprises a representation of a first device configured to receive commands from the mobile computing device, and the second command layer comprises a representation of a second device configured to receive commands from the mobile computing device; and

means for performing the determined function on the first object or the second object comprises means for sending an instruction to perform the determined function to the first device or the second device.

53. The mobile computing device of claim 43, wherein a first group of the one or more touch sensors disposed substantially on a front of the mobile computing device is mapped to the first command layer, and a second group of the one or more touch sensors disposed substantially on a back of the mobile computing device is mapped to the second command layer.

54. The mobile computing device of claim 53, wherein the received input is one of two or more inputs received by the processor at overlapping times from one of the touch sensors of the third group and a touch sensor from among the first group and the second group.

55. The mobile computing device of claim 53, wherein a third group of the one or more touch sensors disposed substantially on a side of the mobile computing device is mapped to one or more of the first command layer and the second command layer.

56. The mobile computing device of claim 55, wherein the received input is one of two or more inputs received by the processor at overlapping times from one of the touch sensors of the third group and a touch sensor from among the first group and the second group.