

Claims

~~What is claimed is:~~

1. A touch sensitive device comprising:
 - a. touch interface comprising rows and columns;
 - b. signal generator for generating a plurality of signals on at least a plurality of the rows, respectively;
 - c. touch processor for identifying touch on the touch interface by processing touch signals present on the columns, and outputting a stream of touch events; and
 - d. decimator that:
 - i. receives the stream of touch events,
 - ii. selectively identifies one or more of the touch events in the stream, and
 - iii. outputs an modified-output stream of touch events for use by the touch sensitive device, wherein the modified-output stream of touch events does not include the selectively identified touch events.
- ~~2. The touch sensitive device of claim 1, wherein the plurality of signals comprise a plurality of unique orthogonal signals.~~
- ~~3. The touch sensitive device of claim 1, wherein the decimator is configured to receive GUI element boundary information from software running on the touch sensitive device and use the GUI element boundary information to change a decimation scheme.~~
- ~~4. The touch sensitive device of claim 3, wherein the GUI element boundary information comprises GUI element boundary transition information.~~
- ~~5. The touch sensitive device of claim 3, wherein the decimation scheme comprises a scheme by which the decimator determines which events in the stream to pass along.~~
- ~~6. The touch sensitive device of claim 3, wherein the decimation scheme comprises a scheme by which the decimator determines which events in the stream to drop.~~
- ~~7. The touch sensitive device of claim 3, wherein the decimation scheme comprises a scheme by which the decimator determines whether to generate events and add the generated events to the stream.~~

- ~~8. The touch sensitive device of claim 3, wherein the software running on the touch sensitive device comprises application software.~~
- ~~9. The touch sensitive device of claim 3, wherein the software running on the touch sensitive device comprises application software.~~
- ~~10. The touch sensitive device of claim 3, wherein the decimator is configured to use the GUI element boundary information to include in the modified stream a first event that is inside a GUI element.~~
- ~~11. The touch sensitive device of claim 3, wherein the decimator is configured to use the GUI element boundary information to include in the modified stream a first event that is outside a GUI element.~~
- ~~12. The touch sensitive device of claim 1, wherein the decimator is configured to decimate ambiguous input.~~
- ~~13. The touch sensitive device of claim 12, wherein the ambiguous input is input that is performed directly on a GUI element boundary.~~
- ~~14. The touch sensitive device of claim 3, wherein the decimator is configured to use the GUI element boundary information to apply a plurality of different decimation schemes to events within a plurality of different GUI elements, such that an event occurring within a first GUI element has a different applied to it than an event occurring within a second GUI element.~~
- ~~15. The touch sensitive device of claim 1, wherein the decimator is configured to select a decimation scheme based on a determination of a type of input device being used.~~
- ~~16. The touch sensitive device of claim 15., wherein the decimator is configured to determine whether a pen or a finger is being used.~~
- ~~17. The touch sensitive device of claim 1, wherein the decimator is configured to select a decimation scheme based on an identification of a user associated with an event in the event stream.~~

~~18. The device of claim 1, wherein the decimator is configured to sample the stream of touch events at every N input events such that the modified stream includes every Nth input event from the stream of touch events.~~

~~19. The device of claim 18, configured such that N is a tunable parameter.~~

~~20. The device of claim 1, wherein the decimator is configured to sample the stream of touch events at every X microseconds such that the modified stream includes events from the stream of touch events that occurred every X microseconds.~~

~~21. The device of claim 20, configured such that X is a tunable parameter.~~

~~22. The device of claim 1, wherein the decimator is configured to include a first input event of the stream of touch events in the modified stream.~~

~~23. The device of claim 1, wherein the decimator is configured to include a last input event of the stream of touch events in the modified stream.~~

~~24. The device of claim 1, wherein the decimator is configured to include a first input event and a last input event of the stream of touch events in the modified stream.~~

~~25. The device of claim 24, wherein the first input event is first in time in the stream of touch events.~~

~~26. The device of claim 24, wherein the first input event is first sequentially in the stream of touch events.~~

~~27. The device of claim 1, wherein the decimator is configured to sample the stream of touch events such that the modified stream includes events that represent meaningful changes in curvature of motion represented by the input event stream.~~

~~28. The device of claim 1, wherein the decimator is configured to sample the stream of touch events such that the modified stream includes events that represent meaningful changes in velocity of motion represented by the input event stream.~~

~~29. The device of claim 1, wherein the decimator is configured to sample the stream of touch events such that the modified stream includes events that represent meaningful changes in pressure of touch events represented by the input event stream.~~

~~30. The device of claim 1, wherein the decimator is configured to sample the stream of touch events such that the modified stream includes events that represent meaningful changes in number of touches represented by the input event stream.~~

~~31. The device of claim 1, wherein the decimator is configured to use an increased amount of decimation when a specified input mode is active.~~

~~32. The device of claim 31, wherein the device is configured to control the specified input mode via an application running on the device.~~

~~33. The device of claim 31, wherein the device is configured to control the specified input mode via a user interface.~~

~~34. The device of claim 1, wherein the decimator is configured to use a decreased amount of decimation when a specified input mode is active.~~

~~35. The device of claim 34, wherein the device is configured to control the specified input mode via an application running on the device.~~

~~36. The device of claim 34, wherein the device is configured to control the specified input mode via a user interface.~~

~~37. The device of claim 1, wherein the decimator is configured to not use decimation when a specified input mode is active.~~

~~38. The device of claim 1, wherein the decimator is configured to use a different decimation scheme when a specified input mode is active.~~

~~39. The device of claim 1, wherein the decimator is configured to use at least one input hardware characteristic to determine whether at least one input event is decimated.~~

~~40. The device of claim 1, wherein the decimator is configured to use at least one characteristic of an input to determine whether at least one input event is decimated.~~

~~41. The device of claim 1, wherein the touch processor comprises a processor in the touch sensitive device.~~

~~42. The device of claim 1, wherein the touch processor comprises a processor in a computing device.~~

~~43. The device of claim 1, wherein the decimator and the touch processor are a single hardware processor.~~

~~44. The device of claim 1, wherein the decimator is a separate hardware processor from the touch processor.~~

~~45~~2. A touch sensitive device comprising:

- a. touch interface comprising rows and columns;
- b. signal generator for generating a plurality of signals on at least a plurality of the rows, respectively;
- c. touch processor for identifying touch on the touch interface by processing touch signals present on the columns, and outputting a stream of touch events; and
- d. decimator that:
 - i. receives the stream of touch events,
 - ii. selectively identifies for use by the touch sensitive device one or more of the touch events in the stream, and
 - iii. outputs an output stream of touch events for use by the touch sensitive device, the output stream of touch events including the selectively identified one or more touch events.

~~46. The touch sensitive device of claim 45, wherein the plurality of signals comprise a plurality of unique orthogonal signals.~~

~~47. The touch sensitive device of claim 45, wherein the decimator is configured to receive GUI element boundary information from software running on the touch sensitive device and use the GUI element boundary information to change a decimation scheme.~~

~~48. The touch sensitive device of claim 47, wherein the GUI element boundary information comprises GUI element boundary transition information.~~

~~49. The touch sensitive device of claim 47, wherein the decimation scheme comprises a scheme by which the decimator determines which events in the stream to pass along.~~

~~50. The touch sensitive device of claim 47, wherein the decimation scheme comprises a scheme by which the decimator determines which events in the stream to drop.~~

~~51. The touch sensitive device of claim 47, wherein the decimation scheme comprises a scheme by which the decimator determines whether to generate events and add the generated events to the stream.~~

~~52. The touch sensitive device of claim 47, wherein the software running on the touch sensitive device comprises application software.~~

~~53. The touch sensitive device of claim 47, wherein the software running on the touch sensitive device comprises application software.~~

~~54. The touch sensitive device of claim 47, wherein the decimator is configured to use the GUI element boundary information to include in the modified stream a first event that is inside a GUI element.~~

~~55. The touch sensitive device of claim 47, wherein the decimator is configured to use the GUI element boundary information to include in the modified stream a first event that is outside a GUI element.~~

~~56. The touch sensitive device of claim 45, wherein the decimator is configured to decimate ambiguous input.~~

~~57. The touch sensitive device of claim 56, wherein the ambiguous input is input that is performed directly on a GUI element boundary.~~

~~58. The touch sensitive device of claim 47, wherein the decimator is configured to use the GUI element boundary information to apply a plurality of different decimation schemes to events within a plurality of different GUI elements, such that an event occurring within a first GUI element has a different applied to it than an event occurring within a second GUI element.~~

- ~~59. The touch sensitive device of claim 45, wherein the decimator is configured to select a decimation scheme based on a determination of a type of input device being used.~~
- ~~60. The touch sensitive device of claim 59, wherein the decimator is configured to determine whether a pen or a finger is being used.~~
- ~~61. The touch sensitive device of claim 45, wherein the decimator is configured to select a decimation scheme based on an identification of a user associated with an event in the event stream.~~
- ~~62. The device of claim 45, wherein the decimator is configured to sample the stream of touch events at every N input events such that the modified stream includes every Nth input event from the stream of touch events.~~
- ~~63. The device of claim 62, configured such that N is a tunable parameter.~~
- ~~64. The device of claim 45, wherein the decimator is configured to sample the stream of touch events at every X microseconds such that the modified stream includes events from the stream of touch events that occurred every X microseconds.~~
- ~~65. The device of claim 64, configured such that X is a tunable parameter.~~
- ~~66. The device of claim 45, wherein the decimator is configured to include a first input event of the stream of touch events in the modified stream.~~
- ~~67. The device of claim 45, wherein the decimator is configured to include a last input event of the stream of touch events in the modified stream.~~
- ~~68. The device of claim 45, wherein the decimator is configured to include a first input event and a last input event of the stream of touch events in the modified stream.~~
- ~~69. The device of claim 68, wherein the first input event is first in time in the stream of touch events.~~
- ~~70. The device of claim 68, wherein the first input event is first sequentially in the stream of touch events.~~

~~71. The device of claim 45, wherein the decimator is configured to sample the stream of touch events such that the modified stream includes events that represent meaningful changes in curvature of motion represented by the input event stream.~~

~~72. The device of claim 45, wherein the decimator is configured to sample the stream of touch events such that the modified stream includes events that represent meaningful changes in velocity of motion represented by the input event stream.~~

~~73. The device of claim 45, wherein the decimator is configured to sample the stream of touch events such that the modified stream includes events that represent meaningful changes in pressure of touch events represented by the input event stream.~~

~~74. The device of claim 45, wherein the decimator is configured to sample the stream of touch events such that the modified stream includes events that represent meaningful changes in number of touches represented by the input event stream.~~

~~75. The device of claim 45, wherein the decimator is configured to use an increased amount of decimation when a specified input mode is active.~~

~~76. The device of claim 75, wherein the device is configured to control the specified input mode via an application running on the device.~~

~~77. The device of claim 75, wherein the device is configured to control the specified input mode via a user interface.~~

~~78. The device of claim 45, wherein the decimator is configured to use a decreased amount of decimation when a specified input mode is active.~~

~~79. The device of claim 78, wherein the device is configured to control the specified input mode via an application running on the device.~~

~~80. The device of claim 78, wherein the device is configured to control the specified input mode via a user interface.~~

~~81. The device of claim 45, wherein the decimator is configured to not use decimation when a specified input mode is active.~~

~~82. The device of claim 45, wherein the decimator is configured to use a different decimation scheme when a specified input mode is active.~~

~~83. The device of claim 45, wherein the decimator is configured to use at least one input hardware characteristic to determine whether at least one input event is decimated.~~

~~84. The device of claim 45, wherein the decimator is configured to use at least one characteristic of an input to determine whether at least one input event is decimated.~~

~~85. The device of claim 45, wherein the touch processor comprises a processor in the touch sensitive device.~~

~~86. The device of claim 45, wherein the touch processor comprises a processor in a computing device.~~

~~87. The device of claim 45, wherein the decimator and the touch processor are a single hardware processor.~~

~~88. The device of claim 45, wherein the decimator is a separate hardware processor from the touch processor.~~

~~89~~3. A method comprising:

generating a stream of touch events on a touch interface of a touch device, the touch interface comprising rows and columns, the touch device including a signal generator for generating a plurality of signals on at least a plurality of the rows, respectively and a touch processor for processing touch signals present on the columns to produce the stream of touch events;

receiving the stream of touch events,

selectively identifying, for use by a touch sensitive device, one or more of the touch events in the stream, and

outputting an output stream of touch events for use by the touch sensitive device, the output stream of touch events including the selectively identified one or more touch events.

~~904.~~ The method of claim ~~893~~, wherein the plurality of signals comprise a plurality of unique orthogonal signals.

~~915.~~ The method of claim ~~904~~, wherein the output stream of touch events for use by the touch sensitive device consists of the selectively identified one or more touch events.

~~926.~~ The method of claim ~~904~~, further comprising:

selectively identifying a different one or more of the touch events in the stream;

outputting another output stream of touch events for use by the touch sensitive device, the another output stream of touch events including the selectively identified different one or more touch events.

~~93. The method of claim 92, further comprising outputting more than two output streams of touch events for use by the touch sensitive device.~~

~~94. The method of claim 92, wherein a set of touch events consisting of the one or more touch events in the stream differs from a set of touch events consisting of the different one or more touch events in the stream.~~

~~95. The method of claim 93, wherein the set of touch events consisting of the one or more touch events in the stream and the set of touch events consisting of the different one or more touch events in the stream contain mutual elements.~~

~~96. The method of claim 93, wherein the set of touch events consisting of the one or more touch events in the stream is mutually exclusive of the set of touch events consisting of the different one or more touch events in the stream.~~

~~97. The method of claim 92, further comprising:~~

~~selectively identifying a different one or more of the touch events in the stream; and~~

~~outputting another output stream of touch events for use by the touch sensitive device, the another output stream of touch events including the selectively identified different one or more touch events.~~

~~98. The method of claim 97, wherein a set of touch events consisting of the one or more touch events in the stream differs from a set of touch events consisting of the different one or more touch events in the stream.~~

~~99. The method of claim 98, wherein the set of touch events consisting of the one or more touch events in the stream and the set of touch events consisting of the different one or more touch events in the stream contain mutual elements.~~

~~100. The method of claim 98, wherein the set of touch events consisting of the one or more touch events in the stream is mutually exclusive of the set of touch events consisting of the different one or more touch events in the stream.~~

~~101. The method of claim 91, where the stream of touch events for use by the touch sensitive device is streamed to a processing stack within the touch sensitive device, and the another stream of touch events for use by the touch sensitive device is streamed to a different processing stack within the touch sensitive device.~~

~~102. The method of claim 92, where the stream of touch events for use by the touch sensitive device is streamed to a processing stack within the touch sensitive device, and the another stream of touch events for use by the touch sensitive device is streamed to a different processing stack within the touch sensitive device.~~

~~103~~7. A touch sensitive device comprising:

- a. touch interface comprising rows and columns;
- b. signal generator for generating a plurality of signals on at least a plurality of the rows, respectively;
- c. touch processor for identifying touch on the touch interface by processing touch signals present on the columns, and outputting a stream of touch events; and
- d. decimator that:
 - i. receives the stream of touch events,
 - ii. selectively combines one or more of the touch events in the stream, and

iii. outputs an modified-output stream of touch events for use by the touch sensitive device, the modified-output stream of touch events including the selectively combined one or more touch events.

~~104. The touch sensitive device of claim 103, wherein the plurality of signals comprise a plurality of unique orthogonal signals.~~

~~105~~8. A touch sensitive device comprising:

- a. touch interface comprising rows and columns;
- b. signal generator for generating a plurality of signals on at least a plurality of the rows, respectively;
- c. touch processor for identifying touch on the touch interface by processing touch signals present on the columns, and outputting a stream of touch events; and
- d. decimator that
 - i. receives the stream of touch events,
 - ii. selectively inserts one or more estimated touch events in the stream, and
 - iii. outputs an modified-output stream of touch events for use by the touch sensitive device, wherein the modified-output stream of touch events includes the selectively inserted one or more estimated touch events.

~~106. The touch sensitive device of claim 105, wherein the plurality of signals comprise a plurality of unique orthogonal signals.~~

~~107~~9. The touch sensitive device of claim ~~105~~8, wherein the decimator is configured to estimate the estimated touch events based on time or on motion represented by a plurality of the touch events.

~~108. The touch sensitive device of claim 105, wherein the decimator is configured to estimate the estimated touch events based on motion represented by a plurality of the touch events.~~

~~109~~10. A touch sensitive device comprising:

- a. touch interface comprising rows and columns;
- b. signal generator for generating a plurality of signals on at least a plurality of the rows, respectively;
- c. touch processor for identifying touch on the touch interface by processing touch signals present on the columns, and outputting a stream of touch events; and
- d. decimator that
 - i. receives the stream of touch events,
 - ii. generates an modified-output stream of touch events for use by the touch sensitive device, the modified-output stream of touch events being related to the touch on the touch interface.

~~110. The touch sensitive device of claim 109, wherein the plurality of signals comprise a plurality of unique orthogonal signals.~~

~~111. The touch sensitive device claimed in claim 109, wherein the modified-output stream is a compressed form of the stream of touch events.~~

~~112. The touch sensitive device claimed in claim 111, wherein the compressed form of the stream of touch events is a spatial compression compressed in two dimensions.~~

~~113. The touch sensitive device claimed in claim 111, wherein the compressed form of the stream of touch events is a spatial compression compressed in three dimensions.~~

~~114~~12. A touch sensitive device comprising:

first and second plurality of conductors arranged such that:

each of the paths of the conductors of the first plurality of conductors cross each of the paths of the conductors of the second plurality of conductors, and wherein

when the touch sensitive device is not being touched, a first amount of signal is coupled between them, and

when the touch sensitive device is being touched, a different amount of signal is coupled between them;

signal generator adapted to generate a plurality of unique orthogonal signals, each unique orthogonal signal being orthogonal to each of the other unique orthogonal signals;

signal processor being adapted to decode the signals present on each of the second plurality of conductors, and for each of the signals present on each of the second plurality of conductors to determine which of the unique orthogonal signals form a non-negligible part thereof, the signal processor outputting an event stream based on the signals present on each of the second plurality of conductors;

decimator operatively connected to the event stream, the decimator adapted to decimate the event stream and produce at least one output stream for use by the touch sensitive device.

13. The touch sensitive device of any one of claims 1, 2, 7, 8, 10 and 12, wherein the plurality of signals comprise a plurality of unique orthogonal signals.

~~115~~14. The touch sensitive device of any one of claims 1141, 2 and 12, wherein the decimator is configured to receive GUI element boundary information from software running on the touch sensitive device and use the GUI element boundary information to change a decimation scheme.

~~116~~15. The touch sensitive device of claim ~~115~~14, wherein the GUI element boundary information comprises GUI element boundary transition information.

~~117~~16. The touch sensitive device of claim ~~115~~14, wherein the decimation scheme comprises a scheme by which the decimator determines which events in the stream to pass along, a scheme by which the decimator determines which events in the stream to drop or a scheme by which the decimator determines whether to generate events and add the generated events to the stream.

~~118. The touch sensitive device of claim 115, wherein the decimation scheme comprises a scheme by which the decimator determines which events in the stream to drop.~~

~~119. The touch sensitive device of claim 115, wherein the decimation scheme comprises a scheme by which the decimator determines whether to generate events and add the generated events to the stream.~~

~~120~~17. The touch sensitive device of claim ~~115~~14, wherein the software running on the touch sensitive device comprises application software.

~~121. The touch sensitive device of claim 115, wherein the software running on the touch sensitive device comprises application software.~~

~~122~~18. The touch sensitive device of claim ~~115~~14, wherein the decimator is configured to use the GUI element boundary information to include in the ~~modified~~output stream a first event that is inside a GUI element.

~~123. The touch sensitive device of claim 115, wherein the decimator is configured to use the GUI element boundary information to include in the modified stream a first event that is outside a GUI element.~~

~~124~~19. The touch sensitive device of any one of claims ~~114~~1, 2 and 12, wherein the decimator is configured to decimate input that is performed directly on a GUI element boundary or other ambiguous input.

~~125. The touch sensitive device of claim 124, wherein the ambiguous input is input that is performed directly on a GUI element boundary.~~

~~126~~20. The touch sensitive device of claim ~~115~~14, wherein the decimator is configured to use the GUI element boundary information to apply a plurality of different decimation schemes to events within a plurality of different GUI elements, such that an event occurring within a first GUI element has a different applied to it than an event occurring within a second GUI element.

~~127~~21. The touch sensitive device of any one of claims ~~114~~1, 2 and 12, wherein the decimator is configured to select a decimation scheme based on a determination of a type of input device being used or on an identification of a user associated with an event in the event stream.

~~128. The touch sensitive device of claim 127, wherein the decimator is configured to determine whether a pen or a finger is being used.~~

~~129. The touch sensitive device of claim 114, wherein the decimator is configured to select a decimation scheme based on an identification of a user associated with an event in the event stream.~~

~~130~~22. The touch sensitive device of any one of claim ~~114~~1, 2 and 12, wherein the decimator is configured to sample the stream of touch events at every N input events such that the modified-output stream includes every Nth input event from the stream of touch events.

~~131. The device of claim 130, configured such that N is a tunable parameter.~~

~~132~~23. The touch sensitive device of any one of claims ~~114~~1, 2 and 12, wherein the decimator is configured to sample the stream of touch events at every X microseconds such that the modified-output stream includes events from the stream of touch events that occurred every X microseconds.

~~133. The device of claim 132, configured such that X is a tunable parameter.~~

~~134~~24. The touch sensitive device of any one of claims ~~114~~1, 2 and 12, wherein the decimator is configured to include a first input event and/or a last input event of the stream of touch events in the modified-output stream.

~~135. The device of claim 114, wherein the decimator is configured to include a last input event of the stream of touch events in the modified stream.~~

~~136. The device of claim 114, wherein the decimator is configured to include a first input event and a last input event of the stream of touch events in the modified stream.~~

~~137. The device of claim 136, wherein the first input event is first in time in the stream of touch events.~~

~~138. The device of claim 136, wherein the first input event is first sequentially in the stream of touch events.~~

~~139~~25. The touch sensitive device of any one of claims ~~114~~1, 2 and 12, wherein the decimator is configured to sample the stream of touch events such that the modified-output

stream includes events that represent meaningful changes in curvature of motion, velocity of motion, pressure of touch events or number of touches represented by ~~the~~an input event stream.

~~140.—The device of claim 114, wherein the decimator is configured to sample the stream of touch events such that the modified stream includes events that represent meaningful changes in velocity of motion represented by the input event stream.~~

~~141.—The device of claim 114, wherein the decimator is configured to sample the stream of touch events such that the modified stream includes events that represent meaningful changes in pressure of touch events represented by the input event stream.~~

~~142.—The device of claim 114, wherein the decimator is configured to sample the stream of touch events such that the modified stream includes events that represent meaningful changes in number of touches represented by the input event stream.~~

~~143~~26. The touch sensitive device of any one of claims 114~~1, 2 and 12~~, wherein the decimator is configured to use an increased amount of decimation when a specified input mode is active.

~~144. The device of claim 143, wherein the device is configured to control the specified input mode via an application running on the device.~~

~~145. The device of claim 143, wherein the device is configured to control the specified input mode via a user interface.~~

~~146~~27. The touch sensitive device of any one of claims 114~~1, 2 and 12~~, wherein the decimator is configured to use a decreased amount of decimation when a specified input mode is active or to not use decimation when a specified input mode is active.

~~147. The device of claim 146, wherein the device is configured to control the specified input mode via an application running on the device.~~

~~148. The device of claim 146, wherein the device is configured to control the specified input mode via a user interface.~~

~~149. The device of claim 114, wherein the decimator is configured to not use decimation when a specified input mode is active.~~

~~150~~28. The touch sensitive device of any one of claims 114~~1~~, 2 and 12, wherein the decimator is configured to use (i) a different decimation scheme when a specified input mode is active, (ii) at least one input hardware characteristic to determine whether at least one input event is decimated, or (iii) at least one characteristic of an input to determine whether at least one input event is decimated.

~~151. The device of claim 114, wherein the decimator is configured to use at least one input hardware characteristic to determine whether at least one input event is decimated.~~

~~152. The device of claim 114, wherein the decimator is configured to use at least one characteristic of an input to determine whether at least one input event is decimated.~~

~~153~~29. The touch sensitive device of either claim 114~~1~~ or 2, wherein the touch processor comprises a processor in the touch sensitive device or a processor in a computing device, or the decimator and the touch processor are a single hardware processor.

30. The touch sensitive device of claim 12, wherein the signal processor comprises a processor in the touch sensitive device or a processor in a computing device, or the decimator and the signal processor are a single hardware processor.

~~154. The device of claim 114, wherein the touch processor comprises a processor in a computing device.~~

~~155. The device of claim 114, wherein the decimator and the touch processor are a single hardware processor.~~

~~156. The device of claim 114, wherein the decimator is a separate hardware processor from the touch processor.~~