METHOD AND DEVICE FOR RECOGNIZING A DUAL POINT USER INPUT ON A TOUCH BASED USER INPUT DEVICE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] Priority is claimed under 35 U.S.C. § 119 from International Application PCT/IB03/03605 filed Aug. 29, 2003.

BACKGROUND OF THE INVENTION

[0002] 1. Technical Field

[0003] The present invention relates to touch input devices for electronic devices. The present invention is also related to touch screen devices, such as PDAs, mobile telephones or handheld computers. The invention also relates to touch screens and more specifically to implementing a dual input on conventional single-point output touch pads.

[0004] 2. Discussion of Related Art

[0005] Touch screens are used in increasing numbers in handheld electronic devices. Usually the user holds the device in one hand and uses the user interface of the device with the other hand. In certain situations, however, it might be useful to allow the user to use the UI with both hands. However, current resistive touch pads do not allow multiple input. If a user touches the touch pad with two fingers, the device handles this is an error and assumes that the user actually intended to press a point that is the middle point of a line that connects these two input points.

[0006] There are many electric devices that use touch pads for user input, such as PDA, mobile phones, laptop computers and PC monitors. Typically all of them allow only single point user entry on the user input area, such as pressing a graphical icon, a menu item or a drawing with a pen or stylus. However, there is increasing interest in utilizing dual point user input in special cases. An example of this kind of use is a device that has a QUERTY-keyboard with special keys (shift, alt, ctrl, etc.) that must be pressed with another key. Another commonly used user interface feature is a drag & drop—feature that is not possible with current touch pad technologies as it typically requires a shift-key pressed down.

[0007] On computers the user can point on graphical user interfaces (GUI) with a mouse or equivalent pointing device, which may have up to three buttons—the left, the middle and the right button.

[0008] For each position on the screen the user can do either a 'left-click', a 'middle-click' or a 'right-click'. Usually, the left-click function is 'SELECT' and the right-click pops up a menu allocated to that position on the screen. The middle-click is usually application-specific. Such implementations are usually more complicated and less conveniently implemented in touch screen based electronic devices.

[0009] There are actually some touch pad technologies that are capable of detecting more than one input points simultaneously, but these are expensive, require too much operating power, processing power or memory for a mobile device.

DISCLOSURE OF INVENTION

[0010] It is therefore desirable to have an inexpensive touch based input device that can recognize a user input with two input points.

[0011] It is further desirable to enable a conventional touch pad that allows only a single point user input to recognize multiple point user input.

[0012] According to a first aspect of the present invention, there is provided a method for recognizing a dual point user input on a touch based user input device, wherein said input device is only capable of outputting a single input position signal. That is, the touch input device provides on every kind of input a related single position output signal, but there are different input situations possible that produce the same output signal. The method comprises forming or detecting a first position signal, preferably storing said position signal, forming or detecting a subsequent second position signal and determining, if said second position has its source in a simultaneous dual point user input.

[0013] In an example embodiment said method further comprises generating a third position based on said first position and said second position, if said second position has its source in a simultaneous dual point user input. It is also possible to generate said third position even if said second position is not based on a simultaneous dual point user input.

[0014] In another example embodiment said method further comprises using said first position and said third position as the coordinates of said dual point user input.

[0015] Thus, a method is provided for recognizing a dual point user input on a touch based user input device, wherein said input device preferably is only capable of outputting a single input position signal. That is, the touch input device provides on every kind of input a related single position output signal, but there are different input situations possible that produce the same output signal. The method comprises forming or detecting a first position signal, preferably storing said position signal, forming or detecting a subsequent second position signal, determining, if said second position has its source in a simultaneous dual point user input, generating a third position by reflecting said stored first position at said second position, and using said first position and said third position, as the coordinates of a said dual point user input.

[0016] By forming a first position signal related to a first user input to said input device, it is supposed that a single point user input is detected on said touch based input device.

[0017] By preferably storing said first position signal, the position is made available, even if the input point has actually changed its position. Position signals can be stored in the form of a signal itself or e.g. in the form of e.g. binary coded coordinate data. It may be noted that the storing operation of the first use input position can be performed by using a transient memory, as it is known from persistent storage scope technology.

[0018] By preferably forming a second position signal that preferably differs from said first position and that is related to a subsequent second user input to said input device, an event is detected that may have been caused by a dual point user input or by a single point user input. To distinguish between the two possible user inputs, it is determined if said