USER INTERFACE, DEVICE AND METHOD FOR A PHYSICALLY FLEXIBLE DEVICE

FIELD

[0001] The present application relates to a user interface, a device and a method for an improved user interaction, and in particular to a user interface, a device and a method for an improved user interaction through the use of a flexible display.

BACKGROUND

[0002] In recent years, considerable progress has been made towards the development of thin and flexible displays. For example, it is known to have a display device assembly comprising a flexible display device being rollable around an axis. A range of flexible electronic devices based on these technologies, including full color, high-resolution flexible organic light emitting diode, OLED, displays with a thickness of 0.2 mm are being introduced to the market. The goal of such efforts is to provide displays with superior handling, contrast and flexibility.

[0003] It should be noted that the category of displays to which these disclosed embodiments pertain are very different from the type of rigid-surface Liquid Crystal Display (LCD) displays which can be rotated around their respective axes but not deformed.

[0004] Prior art demonstrates the value of incorporating the deformation of computing objects for use as input for computer processes. However, in this document, we propose methods for interacting with flexible displays that rely on deformations of the surface structure of the display itself.

[0005] Another prior art discloses a credit card sized computer that uses physical deformation of the device for browsing of visual information, it should be noted that said device did not incorporate a flexible material, and did not use deformation of the display. Instead, it relied on the use of touch sensors mounted on a rigid LCD-style display body.

[0006] It is also known to have a sort of digital desk which is a physical desk augmented with electronic input and display. A computer controlled camera and projector are positioned above the desk. Image processing is used to determine which page a user is pointing at. Object character recognition transfers content between real paper and electronic documents projected on the desk. This system blurs the boundaries between the digital and physical world by taking a printed number and transferring it into an electronic calculator.

[0007] It is also known to use normal paper as displays and control means.

[0008] It is further known to use a set of interaction techniques for obtaining input to a computer system based on methods and apparatus for detecting properties of the shape, location and orientation of flexible display surfaces, as determined through manual or gestural interactions of a user with said display surfaces. Such input may be used to alter graphical content and functionality displayed on said surfaces or some other display or computing system. In this system a camera is used to detect the position and shape of a paper.

[0009] The use of a camera to detect the position of a screen and/or a user's hands suffers from the drawback that the system is not mobile and requires that the camera is fixed and steady or the image processing becomes very difficult to achieve correctly. Also, as the camera needs to be placed some distance away from the display that it detects the shape and position of the system becomes cumbersome.

[0010] Also a paper system having multiple papers acting as screens suffers from the disadvantage that the whole setup is vulnerable and sensitive to outer influences such as wind or involuntary movement of a paper/display.

[0011] One prior art solution wherein a flexible display is used to give simple commands similar to a single keypress is known where a bend of the screen activates a pre-specified action. In such a solution the proposed UI is limited to simple actions such as scroll or zoom and will not be sufficient to satisfy all requirements of a modern device being capable of executing a plurality of differing applications.

[0012] Thus a user interface and a device incorporating such user interface having a flexible screen capable of being small and mobile while still allowing several user actions to be taken is desirable.

SUMMARY

[0013] On this background, it would be advantageously to provide a user interface, a device and a method that overcomes or at least reduces the drawbacks indicated above by providing a flexible user interface.

[0014] The disclosed embodiments provide a user interface comprising a flexible display and a controller configured to detect a first bend and determine a resulting first foldline, determine a graphical object being intersected by said first foldline and execute a function associated with said graphical object.

[0015] This allows a user to select an item without moving his hands and without requiring additional keys or external hardware.

[0016] In one embodiment the display is configured to display the graphical object.

[0017] In one embodiment the controller is further configured to detect a second bend and determine a resulting second foldline, determine a second graphical object being intersected by said second foldline and wherein said function is associated with or performed on said second graphical object.

[0018] In one embodiment the controller is further configured to determine a second graphical object being intersected by said first foldline and wherein said function is associated with or executed on said second graphical object.

[0019] In one embodiment the controller is further configured to detect a variation in said first bend and determine a resulting second foldline and determine a second graphical object being intersected by said second foldline and wherein said function is associated with or executed on said second graphical object.

[0020] In one embodiment the controller is further configured to detect a third graphical object being intersected by said first foldline and wherein said function is associated with or executed on said third graphical object.

[0021] These embodiments allow a user to combine several items in one function. For example, it allows for combining one item representing an operation with one or more items representing operands.

[0022] In one embodiment the display is a touchdisplay and said controller is further configured to detect a touch input identifying a graphical object on said display wherein said function is associated with or executed on said second graphical object.

[0023] This allows a user to combine touch input with bending input which increases the number of possible com-