

object directly beneath the display becomes the source of the information transfer. In a non-limiting example, if a flexible display is placed top of a printer peripheral, the rubbing gesture would cause its content to be printed on said printer. In another non-limiting example, when an empty flexible display is rubbed on top of a computer screen, the active window on that screen will be transferred to the flexible display such that it displays on said display. When the flexible display contains content, said content is transferred back to the computer screen instead. In a final non-limiting example, when one flexible display is placed on top of another flexible display the rubbing gesture, applied to the top display, causes information to be copied from the top to the bottom display if the top display holds content, and from the bottom to the top display if the top display is empty. In all examples pertaining to the rubbing gesture, information transfer may be limited to those graphical objects that are currently selected on the source display.

**[0055]** Staple. Like a physical staple linking a set of pages, two or more flexible displays may be placed together such that one impacts the second with a detectable force that is over a set threshold (see FIG. 8). This gesture may be used to clone the information associated with the moving flexible display onto the stationary destination document, given that the destination flexible display is empty. If the destination display is not empty, the action shall be identical to that of the collate gesture.

**[0056]** Point. Users can point at the content of a paper window using their fingers or a digital pen (see FIG. 9). Fingers and pens are tracked by either computer vision, accelerometers, or some other means. Tapping the flexible display once performs a single click. A double click is issued by tapping the flexible display twice in rapid succession.

**[0057]** Two-handed Pointing: Two-handed pointing allows users to select disjoint items on a single flexible display, or across multiple flexible displays that are collocated (see FIG. 10).

#### Interaction Techniques

**[0058]** We designed a number of techniques for accomplishing basic tasks using our gesture set, according to the following non-limiting examples:

**[0059]** Activate. In GUIs, the active document is selected for editing by clicking on its corresponding window. If only one window is associated with one flexible display, the hold gesture can be used to activate that window, making it the window that receives input operations. The flexible display remains active until another flexible display is picked up and held by the user. Although this technique seems quite natural, it may be problematic when using an input device such as the keyboard. For example, a user may be reading from one flexible display while typing in another flexible display. To address this concern, users can bind their keyboard to the active window using a key.

**[0060]** Select. Items on a flexible display can be selected through a one-handed or two-handed pointing gesture. A user opens an item on a page for detailed inspection by pointing at it, and tapping it twice. Two-handed pointing allows parallel use of the hands to select disjoint items on a page. For example, sets of icons can be grouped quickly by placing one finger on the first icon in the set and then tapping one or more icons with the index finger of the other hand.

Typically, flexible displays are placed on a flat surface when performing this gesture. Two-handed pointing can also be used to select items using rubber banding techniques. With this technique, any items within the rubber band, bounded by the location of the two finger tips, are selected upon release. Alternatively, objects on a screen can be selected as those located on a foldline or double foldline (2) produced by bends (see FIG. 6).

**[0061]** Copy & Paste. In GUIs, copying and pasting of information is typically performed using four discrete steps: (1) specifying the source, (2) issuing the copy, (3) specifying the destination of the paste and (4) issuing the paste. In flexible displays, these actions can be merged into simple rubbing gestures:

**[0062]** Transfer to flexible display. Computer windows can be transferred to a flexible display by rubbing a blank flexible display onto the computer screen. The window content is transferred to the flexible display upon peeling the flexible display off the computer screen. The process is reversed when transferring a document displayed on a flexible display back to the computer screen.

**[0063]** Copy Between Displays. Users can copy content from one flexible display to the next. This is achieved by placing a flexible display on top of a blank display. The content of the source page is transferred by rubbing it onto the blank display. If prior selections exist on the source page, only highlighted items are transferred. Scroll. Users can scroll through content of a flexible display in discrete units, or pages. Scrolling action is initiated by half-folding, or folding then flipping the flexible displays around its horizontal or vertical axis with a flip or fold gesture. In a non-limiting example, this causes the next page in the associated content to be displayed on the back side of the flexible display. Users can scroll back by reversing the flip.

**[0064]** Browse. Flips or folds around the horizontal or vertical axis may also be used to specify back and forward actions that are application specific. For example, when browsing the web, a left flip may cause the previous page to be loaded. To return to the current page, users would issue a right flip. The use of spatially orthogonal flips allows users to scroll and navigate a document independently.

**[0065]** Views. The staple gesture can be used to generate parallel copies of a document on multiple flexible displays. Users can open a new view into the same document space by issuing a staple gesture impacting a blank display with a source display. This, for example, allows users to edit disjoint parts of the document simultaneously using two separate flexible displays. Alternatively, users can display multiple pages in a document simultaneously by placing a blank flexible display beside a source flexible display, thus enlarging the view according to the collocate gesture. Rubbing across both displays causes the system to display the next page of the source document onto the blank flexible display that is beside it.

**[0066]** Resize/Scale. Documents projected on a flexible display can be scaled using one of two techniques. Firstly, the content of a display can be zoomed within the document. Secondly, users can transfer the source material to a flexible display with a larger size. This is achieved by rubbing the source display onto a larger display. Upon transfer, the content automatically resizes to fit the larger format.