

## DYNAMIC RESIZING OF CLICKABLE AREAS OF TOUCH SCREEN APPLICATIONS

### FIELD OF INVENTION

[0001] The present invention relates to displaying user interfaces for touch screen application, and more particularly to a method and system for dynamically resizing touch screen input areas to aid user interaction.

### BACKGROUND

[0002] Most software applications are designed to be used with only one pointing device, such as a mouse or stylus. Touch screen applications, however, are typically designed to be used with a variety of pointing devices, such as a user's finger, and various types of styluses. Devices that run such touch screen applications are becoming increasingly smaller in size and have small LCD's on which to display the user interface of the touch screen applications. Examples of such devices include ATMs, PDAs, and cellphones, for instance. Therefore, many touch screen applications are difficult to use. Even well designed touch screen applications can be difficult to use by someone with large fingerprints or diminished motor skills.

[0003] U.S. Pat. No. 5,119,079 discloses a touch screen user interface for a reprographic machine that expands the area of a touch zone on a touch screen when selected to improve accuracy of selection thereof. Although this system is beneficial to the user, the system will not aid the user who continually misses the intended touch zone, the touch zone is expanded only after selected by the user.

[0004] Accordingly, what is needed is an improved method and system for increasing the ease-of-use of a touch screen application.

### SUMMARY

[0005] The present invention provides a method and system for dynamically resizing touch screen input areas to increase the ease-of-use of a touch screen applications. The touch screen application includes a user interface that displays one or more touch screen input areas. Each of the touch screen input areas include a viewable area and a clickable area, wherein a user's touch of the clickable area activates the corresponding touch screen input area. Aspects of the present invention include collecting coordinates of touches on the display in response to user interaction, and analyzing the touch coordinates to determine how often the user has missed the input areas. In response to the number of missed touches reaching a predetermined threshold, both the size of the viewable area and the clickable area of at least one of the input areas, and possibly all areas of a similar size or type, are increased so that the input areas will be easier to touch.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 is a diagram illustrating an example user interface of a conventional touch screen application.

[0007] FIG. 2 is a block diagram of the software environment for a touch screen computer system having improved ease-of-use in accordance with a preferred embodiment of the present invention.

[0008] FIG. 3 is a diagram illustrating an example the user interface of a touch screen application in which the input areas have been enlarged in accordance with the present invention.

[0009] FIG. 4 is a flowchart illustrating the process for dynamically increasing the size of touch screen application input areas in accordance with a preferred embodiment of the present invention.

### DETAILED DESCRIPTION

[0010] The present invention relates to a method and system for dynamically resizing touch screen input areas to aid user interaction. The following description is presented to enable one of ordinary skill in the art to make and use the invention and is provided in the context of a patent application and its requirements. Various modifications to the preferred embodiments and the generic principles and features described herein will be readily apparent to those skilled in the art. Thus, the present invention is not intended to be limited to the embodiments shown, but is to be accorded the widest scope consistent with the principles and features described herein.

[0011] FIG. 1 is a diagram illustrating a user interface of a conventional touch screen application. The touch screen application user interface 10 is shown displaying one or more touch screen input areas 12, each of which includes a viewable area 14 that is displayed to the user, and a clickable area 16 that will activate the corresponding input area 12 when touched. In this example, the touch screen input areas 12 are shown as hypertext links, but may also include buttons and other types of icons. When the touch screen input areas 12 are displayed in relatively small size, a user may have difficulty accurately touching or clicking on the intended input area 12, particularly when a large stylus, such as a finger, is used.

[0012] The present invention provides a method and system for increasing the ease-of-use of a touch screen application by increasing the size of a touch screen input area 12 in response to how often a user fails to click on the intended input area 12. The present invention analyzes both the frequency and the distance missed by finger or stylus touches on the touch screen that do not fall within the input areas 12, and compares the sizes of the input areas 12 to the distances of the missed touches from the input areas 12. If there continue to be missed touches, then the sizes of the input areas 12 are automatically increased in proportion to the distances of the missed touches to make the input areas 12 easier for the user to click on, thereby improving user interaction with the touch screen application.

[0013] FIG. 2 is a block diagram of the software environment for a touch screen computer system having improved ease-of-use in accordance with a preferred embodiment of the present invention. The system includes an operating system 22 capable of executing and displaying one or more touch screen application programs 26, a user presentation and interaction module 24, and an auto-resizing logic module 28.

[0014] When the touch screen applications 26 are executed, each of the touch screen applications 26 inputs touch screen input areas and their coordinates 32 to the user presentation and interaction module 24 for display on a