

Mobile User Interface Using Touch Panel on Rear-facing of Mobile Device

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Abstract. We propose mobile user interface using touch panel(touch screen and touch pad) on rear-facing of mobile device. In this paper, touch pad manufacture in the form of fixed or removable on the rear-facing of mobile device, there is provided a method of recognizing a control command(e.g., click, double click, drag and drop, moving) based on motion of a user's finger. For applying a set of previously defined commands, we are applied interface to application that produced by direct. The proposed algorithm will enable easier and more intuitive to control and operate the mobile device, can apply to application of various forms.

Keywords: Mobile User Interface, Touch Panel, Command Recognition

1 Introduction

The rapid growth of mobile devices including smart-phones and tablet PCs has introduced multimedia content and web services to our lives. Users want to increase their interaction efficiency with mobile devices and applications. To support this demand, the importance of user interface(UIs) has increased. Mobile UIs comprise the interaction between a user and a mobile device. A user's ability to efficiently control the device is strongly related to the UI[1-3].

Depending on the circumstances of use, sometimes it is desirable for a user of a mobile device to control the mobile device and the contents played on the mobile device with the use of one hand. The proposed system can support a user interface(UI) using only the index finger of the hand holding the mobile device.

In this paper, we propose interface for the control and operation of mobile devices using touch pad[4] that a widely used as a input in mobile device. Touch pad manufacture in the form of fixed or removable on the rear-facing of mobile device, a method of recognizing a pointer control command based on finger motion may provide a set of commands for click, double click, drag and drop, and moving operations using a touch input device on a back surface of a mobile terminal, thereby providing a convenient and efficient user interface.

2 Proposed Interface

2.1 System Overview

FIG. 1 illustrates an example of a mobile device having a touch input device on its back surface. Referring to FIG. 1(a), an existing mobile device having a single touch input device on its front surface. Also, referring to FIG. 1(b), the mobile device having the touch input device on its back surface are shown in comparison with each other. In this example, the touch input device is a touch panel provided on a back surface of the mobile device. However, in other examples, the touch input device may be provided at another location of the mobile device, or be detachably attached to the mobile device.



Fig. 1. An example of a mobile device having a touch input device

2.2 Commands Definition

To control the mobile device using touch pad on the rear-facing, click, double click, drag and drop, moving action(up, down, left and right) ie, four actions were defined. In click and double click command are triggered, similar to the gesture of clicking a mouse, touch pad was defined as the act to touch twice, once. The control command corresponding to the length of time for which the pointer is touch on the object may be an object selection command to drag and drop the object, and the object selection command may be triggered in response to the pointer being touch on the object for a predetermined length of time or more. Moving action was defined as to control the movement of the button or image using a momentary movement behavior of up, down, left or right of finger on the touch pad.

2.3 Commands Implementation

This paper is provided a method of recognizing a control command based on finger motion, involving: (a) obtaining coordinate data of a pointer corresponding to a position of a finger in contact with a touch input device of a mobile terminal; (b) obtaining an input continuance time of the coordinate data, and setting values of timer variables based on the input continuance time; (c) setting logic values of a plurality of command logic variables whose logic values of True or False are based on values of the respective timer variables; and (d) recognizing an operation control command of the pointer based on the respective timer variable values and the command logic variable values

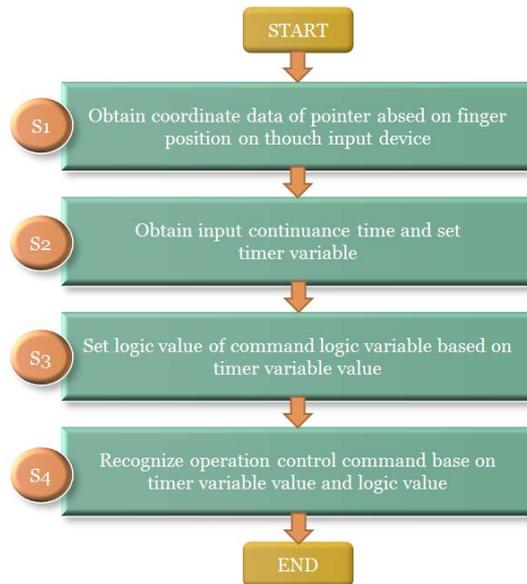


Fig. 2. A flowchart illustrating an example of the overall process of a method of recognizing a pointer control command based on finger motion

3 System Operation and Application

We implemented a few application to demonstrate the mobile interface using touch pad on the rear-facing. An example of control of click, double click is shown in FIG.3. The calculator applications run, after the port setting and connection, calculator was controlled by a set of commands for click, double click, drag and drop, and moving operations using a touch input device. Such a touch input device may also to be used with a front-surface touch input device such that the mobile terminal can be operated and controlled with both hands or with only one hand.

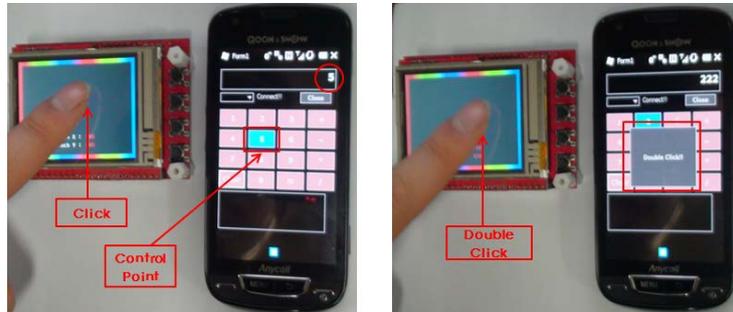


Fig. 3. An example of control of click and double click

4 Conclusion

In this paper, we propose interface for the control and operation of mobile devices using touch pad that a widely used as a input in mobile device. The touch pad manufacture in the form of fixed or removable on the rear-facing of mobile device, there is provided a method of recognizing a control command(e.g., click, double click, drag and drop, moving) based on motion of a user's finger. For applying a set of previously defined commands, we are applied interface to application that produced by direct. The proposed system further estimates the finger movement and operates the calculator applications through the rear-facing touch pad. As a result, this indicates the feasibility of the proposed algorithm for finger movement-based mobile user interfaces.

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