

Issues and Techniques in Touch-Sensitive Tablet Input

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Abstract

Touch-sensitive tablets and their use in human-computer interaction are discussed. It is shown that such devices have some important properties that differentiate them from other input devices (such as mice and joysticks). The analysis serves two purposes: (1) it sheds light on touch tablets, and (2) it demonstrates how other devices might be approached. Three specific distinctions between touch tablets and one button mice are drawn. These concern the signaling of events, multiple point sensing and the use of templates. These distinctions are reinforced, and possible uses of touch tablets are illustrated, in an example application. Potential enhancements to touch tablets and other input devices are discussed, as are some inherent problems. The paper concludes with recommendations for future work.

CR Categories and Subject Descriptors: I.3.1 [Computer Graphics]: Hardware Architecture: Input Devices. I.3.6 [Computer Graphics]: Methodology and Techniques: Device Independence, Ergonomics, Interaction Techniques.

General Terms: Design, Human Factors.

Additional Keywords and Phrases: touch sensitive input devices.

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1. Introduction

Increasingly, research in human-computer interaction is focusing on problems of input [Foley, Wallace & Chan 1984; Buxton 1983; Buxton 1985]. Much of this attention is directed towards input technologies. The ubiquitous Sholes keyboard is being replaced and/or complemented by alternative technologies. For example, a major focus of the marketing strategy for two recent personal computers, the Apple Macintosh and Hewlett-Packard 150, has been on the input devices that they employ (the mouse and touch-screen, respectively).

Now that the range of available devices is expanding, how does one select the best technology for a particular application? And once a technology is chosen, how can it be used most effectively? These questions are important, for as Buxton [1983] has argued, the ways in which the user *physically* interacts with an input device have a marked effect on the type of user interface that can be effectively supported.

In the general sense, the objective of this paper is to help in the selection process and assist in effective use of a specific class of devices. Our approach is to investigate a specific class of devices: touch-sensitive tablets. We will identify touch tablets, enumerate their important properties, and compare them to a more common input device, the mouse. We then go on to give examples of transactions where touch tablets can be used effectively. There are two intended benefits for this approach. First, the reader will acquire an understanding of touch tablet issues. Second, the reader will have a concrete example of how the technology can be investigated, and can utilize the approach as a model for investigating other classes of devices.

2. Touch-Sensitive Tablets

A touch-sensitive tablet (touch tablet for short) is a flat surface, usually mounted horizontally or nearly horizontally, that can sense the location of a finger pressing on it. That is, it is a tablet that can sense that it is being touched, and where it is being