DEPARTMENT OF COMPUTER SCIENCE

M.Sc. Thesis Defense

A-COORD INPUT: AUGMENTED PEN-BASED INTERACTIONS BY COMBINING AUXILIARY INPUT CHANNELS

by

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Abstract

Pen-based interactions are becoming mainstream and are widely popular on a variety of devices, including tabletPCs, mobile devices and tabletop systems. The digital pen has witnessed a number of incarnations as a result of catering to users in creative industries, such as designers, artists and architects. New innovations include the provision of various auxiliary input streams, such as tilt, pressure and roll by means of embedded sensors. Researchers have explored different properties of each channel in isolation of one another. Since the human wrist and fingers can operate two or more of these input channels in conjunction (i.e. pressing and rolling to paint) a natural progression warrants a closer examination of controllability when these channels are operated simultaneously.

In this thesis, I explore a class of interaction techniques I refer to as a-coord input which requires users to control two auxiliary channels simultaneously. Through experiments, I explore the design space of a-coord input and investigate the effect of changing the order in which the channels are combined. Furthermore, I investigate its effectiveness for discrete-item selection, and multi-parameter selection and manipulation tasks. Finally, this thesis shows the value of a-coord input through several applications.