Surface Computing and Collaborative Analysis Work

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ABSTRACT

Large surface computing devices (wall-mounted or tabletop) with touch interfaces and their application to collaborative data analysis, an increasingly important and prevalent activity, is the primary topic of this book. Our goals are to outline the fundamentals of surface computing (a still maturing technology), review relevant work on collaborative data analysis, describe frameworks for understanding collaborative processes, and provide a better understanding of the opportunities for research and development. We describe surfaces as display technologies with which people can interact directly, and emphasize how interaction design changes when designing for large surfaces. We review efforts to use large displays, surfaces or mixed display environments to enable collaborative analytic activity. Collaborative analysis is important in many domains, but to provide concrete examples and a specific focus, we frequently consider analysis work in the security domain, and in particular the challenges security personnel face in securing networks from attackers, and intelligence analysts encounter when analyzing intelligence data. Both of these activities are becoming increasingly collaborative endeavors, and there are huge opportunities for improving collaboration by leveraging surface computing. This work highlights for interaction designers and software developers the particular challenges and opportunities presented by interaction with surfaces. We have reviewed hundreds of recent research papers, and report on advancements in the fields of surface-enabled collaborative analytic work, interactive techniques for surface technologies, and useful theory that can provide direction to interaction design work. We also offer insight into issues that arise when developing applications for multi-touch surfaces derived from our own experiences creating collaborative applications. We present these insights at a level appropriate for all members of the software design and development team.

KEYWORDS

surface computing, interaction design, visualization, analysis, security analysis, collaboration, multi-touch frameworks

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