Collaboration Meets Interactive Spaces

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Editors

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Foreword

Multitouch surfaces are irresistible. People readily walk up to and press their fingers on the surfaces of tabletops and wall displays in museums, galleries, libraries, and stores, anticipating what will happen—when swiping, tapping, pushing, dragging, and stretching the digital content. At the same time, babies are learning, from just a few months old, to swipe before learning any other kind of interaction. It is what they instinctively do now when encountering anything new. Just look at the countless videos online of babies swiping at books, trees, and other objects—with the learned expectation, it will cause an effect.

It is without question that interactive surfaces have come of age—especially for the individual user. But they offer much more—especially the opportunity for multiple people to collaborate around and through them. While early research made in-roads into how to enable this to happen, many questions remain still unanswered. Of central concern is optimizing ways for groups to work together, co-located, or apart, when using shared surfaces of one form or another—be it videoconferencing; sharing of screens in real time; moving between multiple devices in the same place; or using a single shared display. This book covers new research and observations that address the challenges and opportunities of working across surfaces.

Since the early days of the Diamond Touch technology and other customized interactive shared surfaces, there has been much research investigating how to support intuitive interactions. The lightweight and parallel action of touching, the mobility of users, and the increased ability for natural expressions of behavior such as gesture and posture extend the possibilities for communication and collaboration.

Core issues that are covered include the best protocols and norms for enabling people to work together using multiple technologies or shared surfaces and how can they be managed fluidly and effortlessly. People's actions, comments, and gestures can all be seen, heard, and experienced by others using shared surfaces. While such actions may become largely invisible to those executing them, as they are so familiar, their enaction, in contrast, remains visible to others. How do groups exploit these in order to coordinate their actions and interactions? Another feature of surfaces, tangibles and shareable public displays is that they enable simultaneous

control by multiple users. These technologies, therefore, offer new opportunities for situational awareness—gesture, body orientation and more so-called 'natural' means of communication, for making salient in displays the availability of information supported by the public space provided, and for equitable simultaneous control, such as 'entry points' to the technology. Such possibilities, however, raise further questions: What are the best ways to indicate where people are looking, what each other is doing, what other would like you to do, and so on? Flashing cursors, eye gaze marks, haptic buzzes sounds, or other? How should content be downloaded and uploaded to public and shared displays? If gestures are to be used, what kinds and how many can people be reasonably expected to remember?

The chapters in the book show that there are many collaborative practices that lend themselves to being supported by the use of shared surfaces, including emergency response management, rehabilitation, rural areas, videoconferencing, and education. But for every application, different factors need to be considered as to what is the optimal way to support, promote, and augment them. For example, what are the best size, shape, and orientation of the kinds of displays that are used? If a number of displays are available, how should content flow between them so that people understand and manage what is happening? Should everyone be able to interact at the same time or should constraints be put in place to force turn-taking and enable better situation awareness—rather than simply have a free-for-all form of interaction?

The 19 chapters in this book cover a range of topics. In Part I, there are a number of chapters that cover interaction techniques, large displays, and the way other technologies might be used with them, such as wearables. In Part II, case studies and applications are covered that consider different models, frameworks, and software methods for designing and implementing various configurations. Together, they offer new understandings, methods, and frameworks for researchers and designers as a way of generating ideas, codifying observations, and reflecting on how to support collaboration around interactive surfaces.

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Prof. Yvonne Rogers
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