

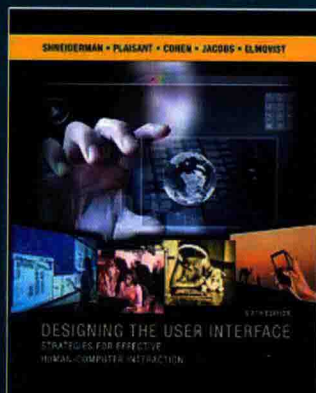
用户界面设计

——有效的人机交互策略（第六版）

Designing the User Interface
Strategies for Effective Human-Computer Interaction
Sixth Edition

英文版

[美] Ben Shneiderman 等著



国外计算机科学教材系列

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内 容 简 介

用户界面设计能够充分体现交互系统中人与计算机有效交互的策略。本书集计算机科学、心理学、社会学、人因工程学于一体,用生动的事例、实用的设计指南,详细阐述了用户界面设计的基本概念及理论、开发过程、各种交互风格和诸多具体设计问题。本书内容引导读者关注普遍可用性问题、建立以用户为中心的设计理念,要求用户界面的设计不仅要适应桌面计算机,还要适应基于 Web 的服务和日益多样化的移动设备,以实现普适计算的目标。

本书案例丰富,网上配有相关的支持材料,是用户界面设计、人机交互的软件工程方法等人机交互课程的权威教材,适合交互系统的用户界面设计人员参考阅读。

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Preface

Designing the User Interface is written for students, researchers, designers, managers, and evaluators of interactive systems. It presents a broad survey of how to develop high-quality user interfaces for interactive systems. Readers with backgrounds in computer science, engineering, information science/studies/systems, business, psychology, sociology, education, and communications should all find fresh and valuable material. Our goals are to encourage greater attention to user experience design issues and to promote further scientific study of human-computer interaction, including the huge topic of social media participation.

Since the publication of the first five editions of this book in 1986, 1992, 1998, 2005, and 2010, HCI practitioners and researchers have grown more numerous and influential. The quality of interfaces has improved greatly, while the community of users and its diversity have grown dramatically. Researchers and designers deserve as much recognition as the Moore's Law community for bringing the benefits of information and communications technologies to more than 6 billion people. In addition to desktop computers, designers now must accommodate web-based services and a diverse set of mobile devices. User-interface and experience designers are moving in new directions. Some innovators provoke us with virtual and augmented realities, whereas others offer alluring scenarios for ubiquitous computing, embedded devices, and tangible user interfaces.

These innovations are important, but much work remains to be done to improve the experiences of novice and expert users who still struggle with too many frustrations. These problems must be resolved if we are to achieve the goal of universal usability, enabling all citizens in every country to enjoy the benefits of these new technologies. This book is meant to inspire students, guide designers, and provoke researchers to seek those solutions.

Keeping up with the innovations in human-computer interaction is a demanding task, and requests for an update begin arriving soon after the publication of each edition. The expansion of the field led the single author of the first three editions, Ben Shneiderman, to turn to Catherine Plaisant, a long-time valued research partner, for coauthoring help with the fourth and fifth editions. In addition, two contributing authors lent their able support to the fifth edition: Maxine S. Cohen and Steven M. Jacobs have long experience teaching with earlier editions of the book and provided fresh perspectives that improved the quality for all readers and instructors. In preparing for this sixth edition, the team expanded again to include Niklas Elmqvist and Nick Diakopoulos, who are both new colleagues at the University of Maryland. We harvested information

from books and journals, searched the World Wide Web, attended conferences, and consulted with colleagues. Then we returned to our keyboards to write, producing first drafts that served as a starting point to generate feedback from each other as well as external colleagues, HCI practitioners, and students. The work that went into the final product was intense but satisfying. We hope you, the readers, will put these ideas to good use and produce more innovations for us to report in future editions.

New in the Sixth Edition

Readers will see the dynamism of human-computer interaction reflected in the substantial changes to this sixth edition. The good news is that most universities now offer courses in this area, and some require it in computer science, information schools, or other disciplines. Courses and degree programs in human-computer interaction, human-centered computing, user experience design, and others are a growing worldwide phenomenon at every educational level. Although many usability practitioners must still fight to be heard, corporate and government commitments to usability engineering grow stronger daily. The business case for usability has been made repeatedly, and dedicated websites describe numerous projects demonstrating strong return on investment for usability efforts.

Comments from instructors who used the previous editions were influential in our revisions. The main changes were (1) to include more on design methods with case study examples and (2) to totally revise our coverage of social media participation and user-generated content, especially from mobile devices. We made major revisions to every chapter, changing almost every figure and substantially updating the references.

The first chapter more boldly recognizes the success story of HCI and user experience design. The growing issue of universal usability for increasingly diverse users of interactive systems became a separate chapter. The next chapters present design guidelines, principles, and theories that have been substantially updated to reflect new ways of thinking. Part 2 covers refinements to development methodologies and evaluation techniques. Part 3 explores progress in direct manipulation and its extensions such as virtual and augmented reality as well as changes to menus, form fill-in, and command languages brought about by the new platforms (especially mobile devices). Since collaboration and social media participation have become so central, that chapter has been heavily expanded and updated. Part 4 emphasizes high-quality and timely user experiences. The chapter on user manuals has been thoroughly revised to reflect the importance of well-designed documentation and user support in serving the goal of universal usability. Finally, information search and visualization

have their own chapters because each of these topics has grown dramatically in importance.

We strive to give balanced presentations on controversial topics such as 3-D, speech, and natural language interfaces. Philosophical controversies such as the degree of human control and the role of animated characters are treated carefully to present fairly the viewpoints that differ from our own. We gave colleagues a chance to comment on these sections and made a special effort to provide a balanced presentation while making our own opinions clear. Readers will have to judge for themselves whether we succeeded.

Instructors wanted guidelines and summary tables; these elements are shown in boxes throughout the book. The Practitioner Summaries and Researcher Agendas remain popular; they have been updated. The references have been expanded and freshened with many new sources and with classic papers still included. We worked hard to select references that were widely available and often web-accessible. Figures, especially those showing screen designs, age quickly, so many new user interfaces are shown. Printing in full color makes these figures valuable as a record of contemporary design styles.

Ways to Use This Book

We hope that students, practitioners, and researchers who read this book will want to keep it on their shelves or their electronic book readers to consult when they are working on new topics or seeking pointers to the literature.

Instructors may choose to assign the full text in the order that we present it or to make selections from it. The opening chapter is a good starting point for most students, the second chapter was written as a strong foundation for understanding the challenges of universal usability, and the third chapter covers basic guidelines, principles, and theories. We think all readers should start with these foundations. From there, instructors may take different paths depending on their disciplines. For example, instructors might emphasize the following chapters, listed by area:

- Computer science: 4, 5, 7, 8, 9, 10, 15, 16
- Psychology and sociology: 5, 9, 10, 11, 12
- Industrial engineering: 4, 5, 11, 13, 16
- Library and information studies: 5, 8, 9, 11, 12, 15, 16
- Business and information systems: 4, 5, 6, 9, 10, 12, 13, 14
- Education technology: 4, 5, 11, 12, 14
- Communication arts and media studies: 4, 5, 7, 11, 12, 13, 14
- Technical writing and graphic design: 4, 5, 6, 12, 14, 16

Companion Website www.pearsonhighered.com/cs-resources

The presence of the World Wide Web has a profound effect on researchers, designers, educators, and students. We want to encourage intense use of the web by members of all these groups, but the volatility of the web is not in harmony with the permanence of printed books. Publishing numerous website addresses in the book would have been risky because changes are made daily, but we included key websites in a box at the end of each chapter. To provide more website addresses and keep them current, we have established a Companion Website for this book. We hope that interested readers will visit the site and send us ideas for improving it.

In addition to pointers to current web resources, a variety of supplemental materials for this text are available at the book's Companion Website. The following are accessible to all readers who register using the prepaid access card in the front of this book:

- Links to hundreds of human-computer interaction resources, examples, and research studies that enhance and expand on the material in each chapter
- Chapter/section summaries
- Self-test questions and discussion questions for each chapter
- Homework assignments and projects

PowerPoint lecture slides are also available from Addison-Wesley's Instructor Resource Center (<http://www.pearsonhighered.com/irc/>). For information about accessing these instructor's supplements, visit the Instructor Resource Center or send an e-mail to computing@aw.com.

Acknowledgments

Writing is a lonely process; revising is a social one. We are grateful to the many colleagues and students who have made suggestions for improvements to prior editions. After one two-day kickoff meeting, we collaborated smoothly by using e-mail, Dropbox for sharing drafts, Google Docs for group-edited task lists, and hour-long phone conference calls every one to three weeks. Capable coauthors with cooperative personalities made the hard work for this massive project possible even with tight time constraints. We are grateful to Nick Diakopoulos for writing the chapter on communication and collaboration, which provided a fresh perspective on this vital topic, and for reviewing draft chapters.

We've greatly appreciated the comments on draft chapters from many colleagues, including: Sriram Karthik Badam, Gilles Bailly, Andy Cockburn, Jim Dabrowski, Eck Doerry, Steven Dow, Laura Downey, Pierre Dragicevic, Laurie Dringus, Cody Dunne, Jason Dykes, Massoud Ghyam, Marti Hearst, Harold Henke, Pourang Irani, Jonathan Lazar, Clayton Lewis, Kurt Luther, Ethan Munson, Alan Newell, Whitney Quesenbery, Karthik Ramani, Dan Russell, Helen Sarid, Cees Snoek, Erik Stolterman, Pawel Wozniak, and Adil Yalcin. We also thank all the colleagues and industry contacts who have helped us assemble the 170+ figures of the book.

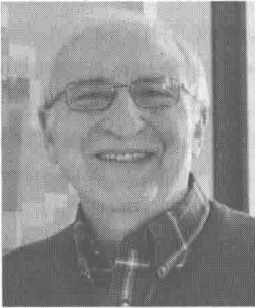
We appreciate our close daily collaborations with faculty at the University of Maryland Human-Computer Interaction Lab, many of whom provided comments on drafts. This supportive community has a profound influence on our work: June Ahn, Ben Bederson, Marshini Chetty, Allison Druin, Leah Findlater, Jon Froehlich, Jen Golbeck, Kent Norman, Doug Oard, Jennifer Preece, and Jessica Vitak. Thanks also to Liese Zahabi, creator of the chapter-opening graphics, which add an uplifting elegance to our work. We also appreciate the undergraduate and graduate students who provide encouraging feedback and challenging questions plus the motivation to keep updating this book.

The publisher's editorial and production staff were involved in this book from the start. We appreciate the contributions of Kristy Alaura, Scott Disanno, Tracy Johnson, Timothy Nicholls, Carole Snyder, Camille Trentacoste, and Katie Ostler. We apologize if we have left out any other contributors. Finally, further thanks goes to the students and professionals from around the world who have sent us inspiring comments and helpful suggestions.

This book is written for the future students and professionals who will continue the remarkable work in human-computer interaction and user experience design that has helped bring the benefits of information and communications technologies to billions of users.

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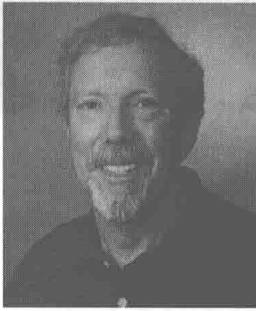
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DESIGNING THE USER INTERFACE

