INTERACTION DESIGN

ROGERS • SHARP • PREECE

beyond human-computer interaction

6th Edition

Praise for *Interaction Design*

Having used the previous editions of *Interaction Design* for research and teaching, given the breadth and depth of its coverage of the related topics, my expectation for this new edition was very high. And it has been fully met! The content is timely, up-to-date, and enlightening with lucid explanations of complex theories and methods of IxD, which are vividly illustrated with contemporary and relevant examples. The writing style is conversational, eloquent, and highly accessible. This entices particularly newcomers of the field, who are enabled to grasp fundamental IxD frameworks with ease, efficiency, and pleasure. Apart from the core descriptions, the extras given, including activities, in-depth activities, and links to external videos, can be very useful for readers to dive deeper into the topics with hands-on practices. Particularly thought-provoking are the materials delineated in "Dilemma." Amplifying the accolades for its predecessors, this sixth edition will continue enjoying the high prestige it well deserves.

Effie Lai-Chong Law, PhD, Professor, Department of Computer Science,
Durham University, UK

Interaction Design by Preece, Sharp, and Rogers has been the standard textbook for interaction design and HCI for many years. This sixth edition once again brilliantly balances theory with practice, essential tools with complexity, and academic rigor with readability. For students, practitioners, and academics, this book is the best starting point for a reflective, critical, and complete introduction to interaction design. Due to the online resources, many real-world examples, and references to academic literature and innovations in industry, this textbook continues to be the reference for the discipline of interaction design.

Steven Houben, Assistant Professor in HCI, Eindhoven
University of Technology (TU/e), The Netherlands

This is the perfect textbook for a wide range of user interface/user experience design courses. For an undergraduate, it provides a variety of compelling examples that illustrate best practice in interaction design. For a graduate student, it provides a foundational overview of advanced topics. This book is also essential for the professional who wants to know the state of the art in interaction design. I use this textbook and recommend it widely.

Rosa I. Arriaga, PhD, School of Interactive Computing,
Georgia Institute of Technology, USA

Interaction Design is an excellent textbook for general HCI courses that covers topics from the essential theoretical and methodological knowledge to the state-of-the-art practical knowledge in HCI and interaction design. This book provides a comprehensive understanding of interaction design, which goes beyond the traditional perspective of HCI through in-depth recognition of people and society. The sixth edition again maintains this book's position as a must-have book for all HCI and interaction design students with much more updated topics and examples.

Youn-kyung Lim, Department of Industrial Design, Korea Advanced
Institute of Science and Technology, South Korea

Human-computer interaction (HCI) is a new field that has emerged and become increasingly common in Chinese universities in the last 20 years. *Interaction Design: Beyond Human-Computer Interaction* has been well-known and translated into Chinese for many years. It has been used as a major textbook or reference book for HCI-related courses for undergraduate and postgraduate students in computer science, design, communication, and industrial engineering in Chinese universities. I especially appreciate its focus on HCI design, instead of just focusing on the technological aspects of HCI. The students have benefited a lot from the body of knowledge and skill set of a user-centered design approach for developing products/services with good user experience in an industry context. The timely six revisions of the book in the past years have kept it always well updated to the newest developments in technology and application scenarios.

Zhengjie Liu, Professor, School of Information Science & Technology, Dalian
Maritime University, China

Interaction design is a practice that spans many domains. The authors acknowledge this by providing a tremendous amount of information across a wide spectrum of disciplines. This book has evolved from a simple textbook for HCI students to an encyclopedia of design practices, examples, discussions of related topics, suggestions for further reading, exercises, interviews with practitioners, and even a bit of interesting history here and there. I see it as one of the few sources effectively bridging the gulf between theory and practice. A copy has persistently occupied my desk since the first edition, and I regularly find myself revisiting various sections for inspiration on how to communicate the reasoning behind my own decisions to colleagues and peers.

William R. Hazlewood, Principal Design Technologist,
Workday, Inc, USA

Interaction Design has been one of the textbooks of reference at the University of Castilla – La Mancha (Spain) for several years. It covers the main topics in human-computer interaction offering a comprehensive equilibrium between theoretical and practical approaches to the discipline. The new chapter called "Interaction Design in Practice" and the remarkable updates in some chapters, with new case studies and examples, allow the user to explore the book from different perspectives and facilitate its use as a textbook in different subjects.

Manuel Ortega, Professor, Computer Human Interaction
and Collaboration (CHICO) Group, University of Castilla –
La Mancha, Spain

My students like this book a lot! It provides comprehensive coverage of the essential aspects of HCI/UX, which is key to the success of any software application. I also like many aspects of the book, particularly the examples and videos (some of which are provided as hyperlinks), because they not only help to illustrate the HCI/UX concepts and principles but also relate very well to readers. I highly recommend this book to anyone who wants to learn more about HCI/UX.

Fiona Fui-Hoon Nah, Professor, Missouri University of Science
and Technology, USA

While *Interaction Design* is my first recommendation for newcomers to the field of HCI, it is also my primary reference source for content preparation or study planning. The book addresses the topic from different perspectives, making reading a pleasure. This book brings current examples, which makes the knowledge more tangible, as well as links to videos and interviews with practitioners, thus taking the reader to practice in the real world. Very well grounded theoretically and with its hands-on approach to teaching practical techniques, *Interaction Design* is, for sure, the primary reference and textbook for practitioners and academics—students, researchers, or professors— whether new or experienced in the area. Always an up-to-date source, this is definitely my favorite textbook in the field!

Tiago Silva da Silva, Professor Dr, Institute of Science
and Technology (ICT), Federal University of São Paulo
(UNIFESP), São José dos Campos – SP, Brazil

Interaction Design continues to be the standard textbook in the field, and the newest edition is only more thorough. Seasoned practitioners will find it useful when they need a reference to best practices or to explain a concept to a colleague. Students can turn to *Interaction Design* for an easy-to-understand description of the basics or in-depth how-tos. From personas and disabilities to the design of UX organizations and working in Agile, if you're going to pick one book to bring into the office, it should be this one.

JoFish Kaye, Senior Director, Interaction Design & User Experience,
Elevance Health, USA

Interaction Design continues to be my favorite textbook on HCI. I once even named an undergraduate and postgraduate program after it. In its sixth edition, it continues to capture the cumulative body of knowledge on human-centered computing and be the most updated and accessible work available. As always, it serves as a clear pointer to emerging trends in human-computer interaction and interactive technology design and use.

Jesper Kjeldskov, Professor and Head of Department of Human-Centred Computing,
Monash University, Australia

The latest edition of *Interaction Design* continues to be a valuable resource for both undergraduate and graduate educators looking for a comprehensive and designerly introduction to the field. I especially value the authors' introduction to data at scale, which is clear and thorough, including a timely discussion of ethical considerations. A great resource for shaping future practitioners who can go on to iterate practical and humane technology for our daily lives.

Katherine Isbister, Professor, Department of Computational Media at the University of California, Santa Cruz, USA

With the sixth edition of their *Interaction Design* book, Preece, Sharp, and Rogers have managed to capture a field that is changing fast—covering not only traditional desktop interfaces but also recent topics such as brain, smart, robotic, wearable, shareable, augmented reality, and somatic and multimodal interfaces. It is a tremendous achievement to cover the richness of the field while simultaneously delivering a pleasurable and informative reading experience with rich examples, design insights, and methods.

Kia Höök, Professor in Interaction Design, The Royal Institute of Technology, KTH, Sweden

I have been using *Interaction Design* as a textbook since its first edition for both my undergraduate and graduate introductory UX and HCI courses. This is a must-read, seminal book that provides a thorough coverage of the discipline of HCI and the practice of user-centered design. The sixth edition builds on the success and updates of the fifth edition and includes up-to-date content in a field that is rapidly changing and has gained importance in many industries and academic disciplines. This book will teach readers how thoughtful interaction design is the differentiating factor to building optimal designs and experiences. I always recommend *Interaction Design* to students and practitioners who want to gain a comprehensive overview of the fields of HCI and UX.

Olivier St-Cyr, Associate Professor, University of Toronto, Canada

The *Interaction Design* book helps me not only for teaching activities at my Interaction System class but also for HCI-related theses supervision. I really appreciate the authors regarding their efforts in maintaining the relevance and up-to-dateness of the book. For example, they put data at scale and ethical concerns in the new edition. A well-crafted "Activity" section in each chapter in the book is also available to support active and student-centered learning. Really love the book!

Harry Santoso, PhD, Faculty of Computer Science, University of Indonesia, Indonesia

Computers are ubiquitous and embedded in virtually every new device and system, ranging from the omnipresent cellphone to the complex web of sociotechnical systems that envelop most every sphere of personal and professional life. They connect our activities to ever-expanding information resources with previously unimaginable computational power. To ensure interface design respects human needs and augments our abilities is an intellectual challenge of singular importance. It not only involves complex theoretical and methodological issues of how to design effective representations and mechanisms of interaction but also confronts complex social, cultural, and political issues such as those of privacy, control of attention, and ownership of information. The sixth edition of *Interaction Design* continues to be the introductory book I recommend to my students and to anyone interested in this crucially important area.

Jim Hollan, Distinguished Professor of Cognitive Science, University of California, San Diego, USA

Get ready for an engaging and enlightening journey through the world of interaction design with *Interaction Design* by Preece, Sharp, and Rogers! This updated sixth edition is jam-packed with all the essential information you need to succeed in the field of interaction design, human-computer interaction, information design, web design, or ubiquitous computing. It's the ultimate guide for navigating the digital age, and it's always kept up-to-date with the latest developments in the field. Plus, the accompanying online resources are a lifesaver for both instructors and students. But don't just take my word for it—grab a copy of *Interaction Design* and see for yourself! And remember, good design is like a good joke: if you have to explain it, it's not that good. (But don't worry, this book does a great job of explaining it all!)

Johannes Schöning, Professor for Human-Computer Interaction at the University of St. Gallen, Switzerland

This sixth edition commands space on one's bookshelf as one of the must-have classics on interaction design. It offers an expansive view of the fields of interaction design and HCI, on topics ranging from design research to Agile development. This is an essential book for those new to and experienced in interaction design.

Jodi Forlizzi, Herbert A. Simon Professor in Computer Science and HCII, Human-Computer Interaction Institute, The School of Computer Science, CMU, USA

This book illuminates the interaction design field like no other. Interaction design is such a vast, multidisciplinary field that you might think it would be impossible to synthesize the most relevant knowledge in one book. This book does not only that but goes even further: it eloquently brings contemporary examples and diverse voices to make the knowledge concrete and actionable, so it is useful for students, researchers, and practitioners alike. This new edition includes invaluable discussions about the current challenges we now face with data at scale, embracing the ethical design concerns our society needs so much in this era.

Simone D.J. Barbosa, Professor of Computer Science, PUC-Rio, Brazil

Digital technology, mobile devices, and the Internet of Things continue to reach every crevice of human existence from space exploration of faraway planets to health applications such as wearable trackers and medical injectables. The ubiquity of this technology has advanced interaction design to a premier field of study bringing together contributions from computer science, behavioral psychology, science and technology studies, engineering, communication studies, and urban informatics. Guided by the wisdom and experience of these three longstanding thought leaders, this sixth edition offers students, researchers, developers, and design practitioners alike an accessible and comprehensive entry portal into interaction design scholarship and praxis with a thorough coverage of theoretical concepts, applied methods, and empirical cases.

Marcus Foth, PhD, Professor of Urban Informatics, School of Design, Queensland University of Technology Brisbane, Australia

Throughout my teaching of user experience and interaction design, the book by Rogers, Preece, and Sharp has been a cornerstone textbook for students. The authors bring together a wealth of knowledge of academic HCI with a deep understanding of industry practice to provide what must be the most comprehensive introduction to the key areas of interaction design and user experience work, now an established field of practice. As a UX teacher, I always put this book in the "essential reading" section for students. As an interaction design practitioner, I use many of the methods it describes.

Simon Attfield, Principal Human Factors Scientist, Trimetis and Visiting Associate Professor, Middlesex University, UK

Because of the many examples and explanations, this is of course the ideal book for all practitioners, but do not be deceived, because fundamental theory is also presented so that I quote the book very often in my scientific articles. So it is hardly surprising that I have been recommending this book to my students for many years, because it offers a sound theoretical basis as well as countless practical examples, making it an ideal textbook and reference work. It is unbelievable that the authors have managed to keep updating this comprehensive book for 20 years. For me personally, it is the only textbook on my UX top-five books list that I would take to a desert island.

Jörg Thomaschewski, Professor Dr, Faculty of Technology, University of Applied Sciences Emden/Leer, Germany

I got to learn about the field of HCI and interaction design when I came across the first edition of this book at the library in my junior year of college. As an HCI researcher and educator, I have been having the pleasure of introducing the subject to undergraduates and professional master's students using the previous editions. I thank the authors for their studious efforts to update and add new contents that are relevant for students, academics, and professionals to help them learn this ever-evolving field of HCI and interaction design in a delightful manner.

Eun Young Choi, Professor of Human-Computer Interaction, College of Information Studies, University of Maryland, USA

The *Interaction Design* book and its interactive website remain our number-one reference in capacitating generations of HCI students in Namibia. The release of the new edition once more demonstrates its versatile use, accounting for diverse readers. The conscientiously curated content of global and local case studies, accounting for newest trends, technologies, and critical perspectives, continues to encourage our students in the creation of meaningful and sustainable designs, while becoming reflective interaction designers upholding fundamental values of fairness, justice, and care.

Heike Winschiers-Theophilus, Professor, Faculty of Computing and Informatics, Polytechnic of Namibia, Africa

In its sixth edition, *Interaction Design* presents the cutting edge of human-computer interaction research and UX design, showcasing some of the rich history of the field that has produced the "modern classics" of interface design. Importantly, it does not shy away from current challenges such as the safeguarding of personal data in research, or the dilemmas of controversial topics such as activity tracking. The book's pedagogical style invites critical thinking and considering the consequences of design choices, an important skill to develop for designers and researchers alike.

Joel E. Fischer, Professor of Human-Computer Interaction,
Nottingham University, UK

Nearly 20 years have passed since the release of the first edition of *Interaction Design*, with massive changes to technology and thus the science and practice of interaction design. The new edition combines the brilliance of the first book with the wisdom of the lessons learned in the meantime, and the excitement of new technological frontiers. Complex concepts are elegantly and beautifully explained, and the reader is left with little doubt as to how to put them into practice. The book is an excellent resource for those new to interaction design or as a guidebook or reference to practitioners.

Dana McKay, RMIT, Australia

This newest edition is, without competition and with its new additions, the most comprehensive and authoritative source in the field when it comes to modern interaction design. It is highly accessible, and it is a pleasure to read. The authors of this book have once again delivered what the field needs!

Erik Stolterman, Professor of Human Computer Interaction,
Senior Executive Associate Dean, Indiana University, USA

A sixth edition! It's a huge achievement to keep a textbook like this current, and I commend the authors for the work they put in to updating it regularly. *Interaction Design* has been my textbook of choice for generalist and introductory HCI courses ever since the first edition. It is well written, with great use of examples and supplementary resources. It is authoritative and has excellent coverage. Importantly, it is also an engaging read.

Ann Blandford, Professor of Human-Computer Interaction, UCLIC,
University College London, UK

This is the book that both a seasoned expert and an interaction design student want on their bookshelves. The substantially updated and streamlined sixth edition, with its interactive website, makes it a compelling textbook. The conversational writing style with anecdotes, cartoons, and examples make it very engaging. Given the pitfalls of AI, Chapter 10, which is focused on privacy and other ethical design concerns with AI, is a welcome addition to the Responsible AI literature.

Shalini R. Urs, Professor, Founder and Chairperson,
MYRA School of Business, India

The beauty of this books is that it helps both educator and student learn about what is new in interaction design, as well as provide easy access to the methods and knowledge that support good design practice. Bringing together design, technology, and people, it is perfect for guiding design students—who come with an aesthetic sensitivity and an understanding of visual communication—on practical techniques for crafting usable user-centered digital products and experiences. As the world opens up again, I eagerly anticipate this latest edition, to see where we have been and to think about where we might go.

Jeni Paay, Professor of Interaction Design, Director
of Centre for Design Innovation, School of Design +
Architecture, Swinburne University of Technology, Australia

This book is always my primary recommendation for newcomers to human-computer interaction. It addresses the subject from several perspectives: understanding of human behavior in context, the practices of interaction design and evaluation, and the implications of new technology. The new edition again shows dedication to keeping the content up-to-date, in particular with a newly revised chapter on opportunities and challenges of data at large scale.

Robert Biddle, Professor of Human-Computer Interaction,
Carleton University, Ottawa, Canada

The *Interaction Design* book has been helping different generations of graduate and undergraduate students discover the complexity and the beauty of designing digital technologies. Over two decades, the authors have been updating the content brilliantly, facing the challenge of including new concepts, approaches, and theories. Valuable pedagogic support, in the book and its website, as well as insightful interviews with experts, covering an immense interdisciplinary territory, deserve special praise, and so do the chapters dedicated to discussing ethics, privacy, and data collection.

Clarisse Sieckenius de Souza, Professora Emérita,
Departamento de Informática, PUC-Rio, Brazil

I have been a fan of the *Interaction Design* book since taking my first Human-Computer Interaction module during my undergraduate degree, and I now use it as a preferred resource for supporting teaching. The book expertly weaves together a thorough overview of the interaction design process and its foundational concepts, with compelling case studies of state-of-the art research and practice. In this way, the authors have created a resource that is clear and comprehensive, as well as a truly engaging and inspiring read.

Susan Lechelt, Lecturer in Design Informatics, University of
Edinburgh, UK

When I started my career and decided that I wanted to work with the human side of technology, this textbook enlightened me to understand deeply what I had chosen, from the concepts to the ways of working, which brought me here to the tech world. Nowadays, in a developed market with great companies and challenges, we need even more people willing to develop a career with the same goal: improve human life through innovative technology. Therefore, I think this book's new edition is more than necessary, and I highly recommend it, in a professional or academic way, as the most complete textbook for designing human interaction, with contemporary cases and solid ground, theoretical and technical content, and important topics to reflect on, such as ethics and inclusion, but also as an inspiration to follow this path as I did.

Karla Cruz, International UX Research Sr Manager, DiDi, Brazil

This is at the top of my recommended reading list for undergraduate and master's students as well as professionals looking to change career paths. Core issues to interaction design are brought to life through compelling vignettes and contemporary case examples from leading experts. What has long been a comprehensive resource for interaction design now incorporates timely topics in computing, such as data at scale, artificial intelligence, and ethics, making it essential reading for anyone entering the field of interaction design.

Anne Marie Piper, Professor, University California, Dept. of Informatics, Irvine, USA

Designing quality human-computer interactions is crucial for all modern technological systems. As digital devices become smaller, faster, and smarter, the interaction challenges become ever more complex. Vast quantities of data are often accessed on handheld screens, or no screens at all through voice commands; and AI systems have interfaces that "bite back" with sophisticated dialogue structures. What are the best interaction metaphors for these technologies? What are the best tools for creating interfaces that are enjoyable and universally accessible? How do we ensure emerging technologies remain relevant and respectful of human values? In this book, you'll find detailed analysis of these questions and much more. It is a valuable resource for both the mature student and the reflective professional.

Frank Vetere, Professor of Interaction Design,
University of Melbourne, Australia

Interaction design is the craft of pleasing users by making technology do what they want in ways that make sense to them. The explosion of digital tech has been—not surprisingly—accompanied by an explosion in the need for trained professionals who can perform this craft. This book satisfies that need. It's a comprehensive study of the practice of interaction design, covering everything from understanding users to providing solutions that delight them. If this is your chosen field, you will refer to this book many times over during your career, and it will help you be a well-tempered practitioner.

Alan Cooper, Author of About Face, "Father of Visual
Basic," inventor of design personas

The milieu of digital life surrounds us. However, how we choose to design and create our experiences and interactions with these emerging technologies remains a significant challenge. This book provides both a roadmap of essential skills and methodologies to tackle these designs confidently as well as the critical deeper history, literature, and poetry of interaction design. You will return to this book throughout your career to operationalize, ground and inspire your creative practice of interaction design.

Eric Paulos, Professor, University of Berkeley, California, USA

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About the Authors

The authors are senior academics with a background in teaching, researching, and consulting in the United Kingdom, United States, Canada, India, Australia, South Africa, and Europe. Having worked together on five previous editions of this book, as well as an earlier textbook on human-computer interaction, they bring considerable experience in curriculum development using a variety of media for online learning as well as face-to-face teaching. They have expertise in creating learning texts and websites that motivate and support learning for a range of students and collaborating with professionals. All three authors are specialists in interaction design and human-computer interaction (HCI). In addition, they bring skills from other disciplines; for instance, Yvonne Rogers started off as a cognitive scientist, Helen Sharp is a software engineer, and Jenny Preece works in information systems. Their complementary knowledge and skills enable them to cover the breadth of concepts in interaction design and HCI to produce an interdisciplinary text and website that will motivate readers.

Yvonne Rogers is the Director of the Interaction Centre at University College London, a Professor of Interaction Design, and a Deputy Head of the Department for Computer Science. She is internationally renowned for her work in HCI and ubiquitous computing and, in particular, for her pioneering approach to innovation and ubiquitous learning. Yvonne is widely published, and she is the author of two books: *Research in the Wild* (2017, co-authored with Paul Marshall, Morgan & Claypool) and *The Secrets of Creative People* (2014, Belmont Press). She is also a regular keynote speaker at computing and HCI conferences worldwide. Former positions include the Open University (2006–2011), the School of Informatics and Computing at Indiana University (2003–2006), and Sussex University (1992–2003). She has also been a visiting professor at UCSC, University of Cape Town, Melbourne University, Stanford, Apple, Queensland University, and UCSD. She has been elected as a Fellow of the Royal Society, the ACM, the British Computer Society, and the ACM's CHI Academy. She was awarded the Royal Society Robin Milner Medal in 2022 for "outstanding European computer scientist," and an MRC Suffrage and Science Award in 2020 for being one of the leading women in "mathematics and computing." In 2022 she was awarded the ACM SIGCHI Lifetime Achievement Research Award, "presented to individuals for outstanding contributions to the study of human-computer interaction."

Helen Sharp is a Professor of Software Engineering in the Faculty of Science, Technology, Engineering, and Mathematics at the Open University. Originally trained as a software engineer, it was watching the frustration of users and the clever "work-arounds" they developed that inspired her to investigate HCI, user-centered design, and the other related disciplines that now underpin the field of interaction design. She has been developing distance courses in interaction design, software engineering, and business agility since the 1980s. Her research focuses on the study of professional software practice and the effect of human and social aspects on software, the software development process, and software teams. In recent years,

Helen has led research projects in the areas of sociocultural factors in design, agile transformation, motivation and security, and socio-technical resilience, working closely with practitioners to support practical impact. She is active in both the software engineering and CHI communities, and she has had a long association with practitioner-related conferences. Helen is on the editorial board of several software engineering journals, and she is a regular invited speaker at academic and practitioner venues.

Jennifer Preece is Professor and Dean Emerita in the College of Information Studies—"Maryland's iSchool"—at the University of Maryland. Jenny's research focuses on the intersection of information, community, and technology. She is interested in community participation online and offline. She has researched ways to support empathy, patterns of online participation, reasons for not participating, and interaction in technology-supported communities. She was author of one of the first books on online communities—*Online Communities: Designing Usability, Supporting Sociability* (2000) published by John Wiley & Sons Ltd. Currently, Jenny focuses on how technology can be used in citizen science projects. Jenny's particular interest is in technology design for data collection about the world's flora and fauna at a time when many species are in rapid decline due to habitat loss, pollution, and climate change. Jenny is a member of the ACM's CHI Academy, and she is Editor-in-Chief of the online, open-access journal *Citizen Science: Theory and Practice*. She is also on the Board of Directors of Vancouver's Stanley Park Ecology Society.

Acknowledgments

Contents

What's Inside?

Welcome to the sixth edition of *Interaction Design: Beyond Human-Computer Interaction* and our interactive website at www.id-book.com. Building on the success of the previous editions, we have substantially updated and streamlined the material in all the chapters to provide a comprehensive introduction to the fast-growing and multidisciplinary field of interaction design. We have also added an epilogue where we discuss our views of future directions for the field. Rather than let the book expand, however, we have again made a conscious effort to keep it the same length.

Our textbook is aimed at undergraduate and graduate students from a range of backgrounds studying introductory classes in human-computer interaction, interaction design, information and communications technology, web design, software engineering, digital media, information systems, and information studies. It will also appeal to practitioners, designers, and researchers who want to discover what is new in the field or to learn about a specific design approach, method, interface, or topic. It is written in an accessible way and so will appeal to a general audience interested in design and technology.

It is called *Interaction Design: Beyond Human-Computer Interaction* because interaction design is concerned with a broader scope of issues, topics, and methods than was originally the scope of human-computer interaction (HCI)—although nowadays, the two increasingly align in scope and coverage of topics. Throughout the book, we have balanced coverage and discussion of foundational concepts with current, state-of-the-art research that builds on them. We include research in the field and beyond, both current and classic studies, sometimes dating back to when HCI emerged in the 1970s and '80s.

We define interaction design as follows:

> *Designing interactive products to support the way people communicate and interact in their everyday and working lives.*

Interaction design requires an understanding of the capabilities and desires of people and the kinds of technology that are available. Interaction designers use this knowledge to discover requirements and to develop and manage them to produce a design. Our textbook provides an introduction to all of these areas. It teaches practical techniques to support all stages of design and development as well as discussing possible technologies and design alternatives.

The number of different types of interface and applications available to today's interaction designers continues to increase steadily, so our textbook, likewise, has been expanded to cover these new technologies. For example, we discuss and provide examples of brain, smart, robotic, wearable, shareable, augmented reality, and multimodal interfaces, as well as more traditional desktop, multimedia, and web-based interfaces. Interaction design in practice is changing fast, so we cover a range of processes, issues, and examples throughout the book.

The book has 16 chapters, and it includes discussion of the different design approaches in common use; how cognitive, social, and affective issues apply to interaction design; and

how to gather, analyze, and present data for interaction design. A central theme is that design and evaluation are interwoven, highly iterative processes, with some roots in theory but that rely strongly on good practice to create usable products. The book has a hands-on orientation and explains how to carry out a variety of techniques used to design and evaluate the wide range of new applications coming onto the market. It has a strong pedagogical design and includes many activities (with detailed comments) and more complex, in-depth activities that can form the basis for student projects. There are also "Dilemmas," which encourage readers to weigh the pros and cons of controversial issues. Each chapter contains links to videos and recommends additional readings for those who want to go further into a particular topic.

TASTERS

We address topics and questions about the what, why, and how of interaction design. These include the following:

- Why some interfaces are good and others are poor
- Whether people can really multitask
- How technology is transforming the way people communicate with one another
- How we can design products that support people's lives
- How interfaces can be designed to change people's behavior
- How to choose between the many different kinds of interactions that are now available (for example, talking, touching, and wearing)
- What it means to design accessible and inclusive interfaces
- Why carry out studies in the lab versus in the wild
- When to use qualitative and quantitative methods
- How to construct informed consent forms
- How the type of interview questions posed affects the conclusions that can be drawn from the answers given
- How to move from a set of scenarios and personas to initial low-fidelity prototypes
- What is design thinking and what is its relationship with interaction design
- How to visualize the results of data analysis effectively
- How to collect, analyze, and interpret data at scale
- Why do people do something different from what they say
- How to ensure the monitoring and recording of people's activities is ethical
- What are Agile UX and Lean UX and how do they relate to interaction design
- How to collect and interpret analytics to compare different designs ■

The style of writing throughout the book is intended to be accessible to a range of readers. It is largely conversational in nature and includes anecdotes, cartoons, and examples. Many of the illustrations are intended to relate to readers' own experiences. The book and the associated website are also intended to encourage readers to be active when reading and

to think about seminal issues. The goal is for readers to understand that much of interaction design requires consideration of the issues and that it is important to learn to weigh the pros and cons and be prepared to make trade-offs. There is rarely a right or wrong answer, although there is a world of difference between a good design and a poor design.

This book is accompanied by a website (www.id-book.com), which provides a variety of resources, including slides for each chapter, comments on chapter activities, and other resources written by researchers and designers. There are video interviews with a wide range of experts from the field, including professional interaction designers and university professors. We selected people to interview who cover different topics, and we deliberately selected a range of people, from gurus in the field to newly established researchers and professionals. Pointers to respected blogs, online tutorials, YouTube videos, and other useful materials are also provided.
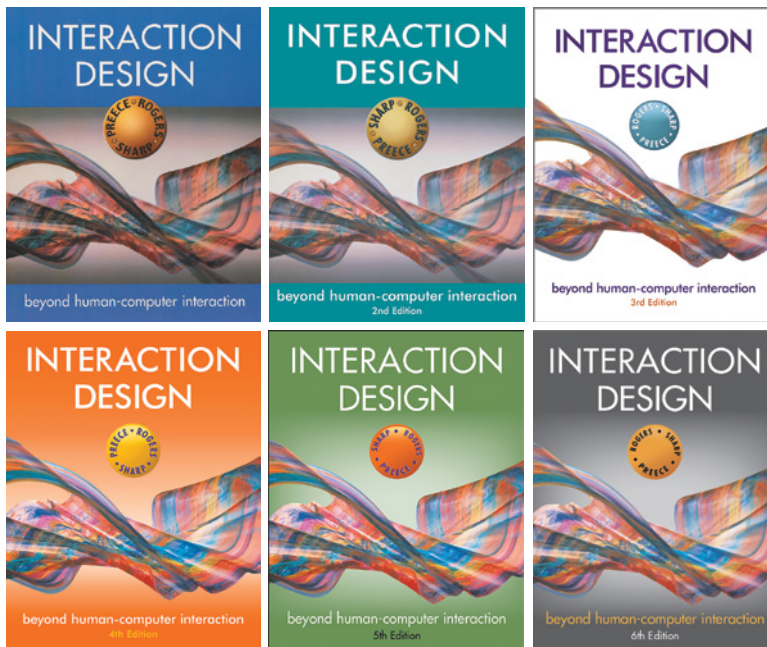
INTERACTION DESIGN

Chapter 1

WHAT IS INTERACTION DESIGN?

Objectives

The main goals of this chapter are to accomplish the following:

- Explain the difference between good and poor interaction design.
- Consider the pros and cons of transforming activities to become digital.
- Describe what interaction design is and how it relates to human-computer interaction and other fields.
- Explain the relationship between the user experience and usability.
- Introduce what is meant by accessibility and inclusiveness in relation to human-computer interaction.
- Describe what and who is involved in the process of interaction design.
- Outline the different forms of guidance used in interaction design.
- Enable you to evaluate an interactive product and explain what is good and bad about it in terms of the goals and core principles of interaction design.

1.1   Introduction

How many interactive products are there in everyday use? Think for a minute about what you use in a typical day: a smartphone, tablet, smartwatch, laptop, remote control, coffee machine, printer, smoothie maker, e-reader, smart TV, alarm clock, electric toothbrush, radio, bathroom

scales, fitness tracker, game console. Then think of which apps and social media you use…the list is endless. Now think for a minute about how usable they are. How many are actually easy, effortless, and enjoyable to use? Some, like a tablet, are a joy to use, where tapping an app and flicking through photos is simple, smooth, and enjoyable. Others, like buying a train ticket from a ticket machine that does not recognize your credit card after completing a number of steps and then makes you start again from scratch, can be very frustrating. Why is there a difference?

Many products that require users to interact with them, such as smartphones and fitness trackers, have been designed primarily with users' needs in mind. They are generally easy and enjoyable to use. Others have not necessarily been designed with the person in mind; rather, they have been engineered primarily as software systems to perform set functions. An example is setting the time of day on a stove, such as when setting it up or after a power failure, that requires a combination of button presses that are not obvious as to which ones to press together or separately. While they may work effectively, it can be at the expense of how easily they will be learned and remembered and therefore used in a real-world context.

Alan Cooper (2018), a well-known user experience guru, bemoans the fact that much of today's software suffers from the same interaction errors that were around 25 years ago. Why is this still the case, given that interaction design has been in existence for more than 30 years and given that there are far more designers now in industry than ever before? He points out how many interfaces of new products do not adhere to the interaction design principles validated in the 1990s. For example, he notes that many apps do not follow even the most basic of user experience design principles, such as offering an "undo" option. He exclaims that it is "inexplicable and unforgivable that these violations continue to resurface in new products today."

How can we rectify this situation so that the norm is that all new products are designed to provide good user experiences? To achieve this, we need to be able to understand how to reduce the negative aspects (such as frustration and annoyance) while enhancing the positive ones (for example, enjoyment and efficacy). This entails developing interactive products that are easy to learn, effective, and pleasurable to use from a user's perspective.

In this chapter, we begin by examining the basics of interaction design. We look at the difference between good and poor design, highlighting how products can differ radically in how usable and enjoyable they are. We consider what is gained and lost from transforming activities to be digital when previously they were done through using physical artifacts. We then describe what and who is involved in the process of interaction design. The user experience, which is a central concern of interaction design, is then introduced. Finally, we outline how to characterize this in terms of usability goals, user experience goals, and design principles. An in-depth activity is presented at the end of the chapter in which you have the opportunity to put into practice what you have read by evaluating the design of an interactive product.

BOX 1.1

What's in a name? User, people, human, or customer?

Several terms have been used to emphasize different aspects of what is being designed, including user interface design (UI), software design, user-centered design, human-centered design, people-centered design, product design, web design, user experience (UX) design, customer

experience (CX) design, and interactive system design. Interaction design (IxD) is generally used as the overarching term to describe the field, including its methods, theories, and approaches. Since about 2010, UX design has been the most widely used term in industry to refer to the profession. However, the terms have been used interchangeably. Also, it depends on each company's ethos and brand.

As the field has matured, Don Norman (2018) has argued for using the more encompassing term *people-centered design* and referring to *people* instead of *users* where it seems more appropriate. Sometimes, continuing to use the term *user* makes sense, however, if it is specifically about how a technology is to be used for or by someone. Likewise, continuing to refer to *user's needs* and the *user experience* can be preferable when considering how to design a specific product. More generally, however, much of what interaction design is about is understanding and augmenting people. In this context, using the term *people* is better, because it is broader, being able to refer to a single person, a group of people, or even whole societies, which is appropriate when describing large social media systems. Here, in the new edition of our textbook, we have changed primarily to using *people-centered* design but have continued to use the term *user-centered* when referring specifically to using an interface.

Customer experience (CX), on the other hand, refers to all of the interactions someone has with a company's offering, including the overall experience, the probability they will continue to use it, and the likelihood they will recommend it to others. In this sense, the UX is part of the wider CX, but the CX covers other aspects that the UX has traditionally not covered (Lowden, 2014). ∎

Video Don Norman explains why adopting a people-centered approach is the way forward: **interaction-design.org/literature/topics/people-centered-design.**

1.2   Good and Poor Design

A central concern of interaction design is to develop interactive products that are usable. By this we mean products that are generally easy to learn, effective to use, and provide an enjoyable experience for the intended people. A good place to start thinking about how to design usable interactive products is to compare examples of well-designed and poorly designed ones. Through identifying the specific weaknesses and strengths of different interactive products, we can begin to understand what it means for something to be usable or not. Here, we describe an example of a poorly designed product that has persisted over the years—the ubiquitous remote control—and contrast this with a well-designed example of the same product that performs the same function.

Every home entertainment system, be it the smart TV, streaming video player, home theater system, and so forth, comes with its own remote control. Each one is different in

terms of how it looks and works. Many have been designed with a dizzying array of small, multicolored, and double-labeled buttons (one on the button and one above or below it) that often seem arbitrarily positioned in relation to one another. Many viewers, especially when sitting in their living rooms, find it difficult to locate the right buttons, even for the simplest of tasks, such as pausing or finding the main menu. It can be especially frustrating for those who need to put on their reading glasses each time to read the buttons. The remote control appears to have been put together very much as an afterthought.

In contrast, much effort and thought went into the design of the classic TiVo remote control with the viewer in mind (see Figure 1.1). TiVo is a digital video recorder that was originally developed to enable the viewer to record TV shows. The remote control was designed with large buttons that were clearly labeled and logically arranged, making them easy to locate and use in conjunction with the menu interface that appeared on the TV screen. In terms of its physical form, the remote device was designed to fit into the palm of a hand, having a peanut shape. It also has a playful look and feel about it: Colorful buttons and cartoon icons are used that are distinctive, making it easy to identify them.

Figure 1.1 The TiVo remote control
Source: business.tivo.com

How was it possible to create such a usable and appealing remote device where so many others have failed? The answer is simple: TiVo invested the time and effort to follow a people-centered design process. Specifically, TiVo's director of product design at the time involved