

3d Interfaces Theory And Practice

Brave NUI World is the first practical guide for designing touch- and gesture-based user interfaces. Written by the team from Microsoft that developed the multi-touch, multi-user Surface® tabletop product, it introduces the reader to natural user interfaces (NUI). It gives readers the necessary tools and information to integrate touch and gesture practices into daily work, presenting scenarios, problem solving, metaphors, and techniques intended to avoid making mistakes. This book considers diverse user needs and context, real world successes and failures, and the future of NUI. It presents thirty scenarios, giving practitioners a multitude of considerations for making informed design decisions and helping to ensure that missteps are never made again. The book will be of value to game designers as well as practitioners, researchers, and students interested in learning about user experience design, user interface design, interaction design, software design, human computer interaction, human factors, information design, and information architecture. Provides easy-to-apply design guidance for the unique challenge of creating touch- and gesture-based user interfaces. Considers diverse user needs and context, real world successes and failures, and a look into the future of NUI. Presents thirty scenarios, giving practitioners a multitude of considerations for making informed design decisions and helping to ensure that missteps are never made again.

Augmented reality (AR) is one of today's most fascinating and future-oriented areas of computer science and technology. By overlaying computer-generated information on views of the real world, AR amplifies human perception and cognition in remarkable new ways. Do you like the virtual first-down line in football games on TV? That's AR. And AR apps are rapidly coming to billions of smartphones, too. Working in AR requires knowledge from diverse disciplines, including computer vision, computer graphics, and human-computer interaction (HCI). Augmented Reality: Principles and Practice integrates all this knowledge into a single-source reference, presenting the most significant AR work with scrupulous accuracy. Dieter Schmalstieg, a pioneer of both AR foundation and application, is drawing from his two decades of AR experience to clearly present the field. Together with mobile AR pioneer and research colleague Tobias Höllerer, the authors address all aspects of the field, illuminating AR from both technical and HCI perspectives. The authors review AR's technical foundations, including display and tracking technologies, show how AR emerges from the symbiosis of computer vision and computer graphics, introduce AR-specific visualization and 3D interaction techniques, and showcase applications from diverse industries. They conclude with an outlook on trends and emerging technologies, including practical pointers for beginning practitioners. This book is an indispensable resource for everyone interested in AR, including software and app developers, engineers, students and instructors, researchers, and hobbyists. For use in educational environments, the authors will provide a companion website containing slides, code examples, and other source materials.

Design and Implementation of 3D Graphics Systems covers the computational

aspects of geometric modeling and rendering 3D scenes. Special emphasis is given to the architectural aspects of interactive graphics, geometric modeling, rendering techniques, the graphics pipeline, and the architecture of 3D graphics systems. The text describes basic 3D computer graphics algorithms and their implementation in the C language. The material is complemented by library routines for constructing graphics systems, which are available for download from the book's website. This book, along with its companion Computer Graphics: Theory and Practice, gives readers a full understanding of the principles and practices of implementing 3D graphics systems.

The interface is the heart and soul of a video game: it is the integral piece that allows a player to interact with the game. In order to create a great interface, you must carefully plan every detail. "Game Interface Design" helps you outline each step and define the goals for your interface. It covers the interface from the first image that appears onscreen to the information displayed during game-play. You'll cover basic design and art principles, explore the world of interface buttons as you learn how to create your own functioning button, and find out how to substitute images and icons for onscreen text. You'll also learn how to incorporate animation and use Flash to create an amazing, interactive interface. Along the way, you'll get a glimpse into the video game industry, including developer and publisher relationships, schedules, budget constraints, and politics of the industry.

Past, Present, and Future Directions

Atom Probe Tomography

Critical Perspectives and Professional Practice

Theory and Practice for Next-Generation Spatial Computing

Designing Natural User Interfaces for Touch and Gesture

Theory and Practice, Second Edition

The VR Book

Explore the latest features of Unity and build VR experiences including first-person interactions, audio fireball games, 360-degree media, art gallery tours, and VR storytelling Key Features Discover step-by-step instructions and best practices to begin your VR development journey Explore Unity features such as URP rendering, XR Interaction Toolkit, and ProBuilder Build impressive VR-based apps and games that can be experienced using modern devices like Oculus Rift and Oculus Quest Book Description This third edition of the Unity Virtual Reality (VR) development guide is updated to cover the latest features of Unity 2019.4 or later versions - the leading platform for building VR games, applications, and immersive experiences for contemporary VR devices. Enhanced with more focus on growing components, such as Universal Render Pipeline (URP), extended reality (XR) plugins, the XR Interaction Toolkit package, and the latest VR devices, this edition will help you to get up to date with the current state of VR. With its practical and project-based approach, this book covers the specifics of virtual reality development in Unity. You'll learn how to build VR apps that can be experienced with modern devices from Oculus, VIVE, and others. This virtual reality book presents lighting and rendering strategies to help you build cutting-edge graphics, and explains URP and rendering concepts that will enable you to achieve realism for your apps. You'll build real-world VR experiences using world space user interface canvases, locomotion and teleportation, 360-degree media, and timeline animation, as well as learn about important VR development concepts, best practices, and performance optimization and user experience strategies. By the end of this Unity book, you'll be fully equipped to use Unity to develop rich, interactive virtual reality experiences. What you will learn Understand the current state of virtual reality and VR consumer products Get started with Unity by building a simple diorama scene

using Unity Editor and imported assets Configure your Unity VR projects to run on VR platforms such as Oculus, SteamVR, and Windows immersive MR Design and build a VR storytelling animation with a soundtrack and timelines Implement an audio fireball game using game physics and particle systems Use various software patterns to design Unity events and interactable components Discover best practices for lighting, rendering, and post-processing Who this book is for Whether you're a non-programmer unfamiliar with 3D computer graphics or experienced in both but new to virtual reality, if you're interested in building your own VR games or applications, this Unity book is for you. Any experience in Unity will be useful but is not necessary.

The two-volume set LNCS 10350 and 10351 constitutes the thoroughly refereed proceedings of the 30th International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems, IEA/AIE 2017, held in Arras, France, in June 2017. The 70 revised full papers presented together with 45 short papers and 3 invited talks were carefully reviewed and selected from 180 submissions. They are organized in topical sections: constraints, planning, and optimization; data mining and machine learning; sensors, signal processing, and data fusion; recommender systems; decision support systems; knowledge representation and reasoning; navigation, control, and autonomous agents; sentiment analysis and social media; games, computer vision; and animation; uncertainty management; graphical models: from theory to applications; anomaly detection; agronomy and artificial intelligence; applications of argumentation; intelligent systems in healthcare and mhealth for health outcomes; and innovative applications of textual analysis based on AI.

UX Design and Usability Mentor Book includes best practices and real-life examples in a broad range of topics like: UX design techniques Usability testing techniques such as eye-tracking User interface design guidelines Mobile UX design principles Prototyping Lean product development with agile vs. waterfall Use cases User profiling Personas Interaction design Information architecture Content writing Card sorting Mind-mapping Wireframes Automation tools Customer experience evaluation The book includes real-life experiences to help readers apply these best practices in their own organizations. UX Design and Usability Mentor Book is an extension of best-selling Business Analyst's Mentor Book. Thanks to the integrated business analysis and UX design methodology it presents, the book can be used as a guideline to create user interfaces that are both functional and usable.

A compelling and insightful look at the future of Spatial Computing, and how this cutting-edge technology is changing the way we do business across seven primary industries, and what it means for humanity as a whole. Key Features Discover how Spatial Computing is changing the face of technology Get a roadmap for the disruptions caused by Spatial Computing and how it will affect seven major industries Gain insights about the past, present, and future of technology from the world's leading experts and innovators Book Description What is Spatial Computing and why is everyone from Tesla, Apple, and Facebook investing heavily in it? In The Infinite Retina, authors Irena Cronin and Robert Scoble attempt to answer that question by helping you understand where Spatial Computing—an augmented reality where humans and machines can interact in a physical space—came from, where it's going, and why it's so fundamentally different from the computers or mobile phones that came before. They present seven visions of the future and the industry verticals in which Spatial Computing has the most influence—Transportation; Technology, Media, and Telecommunications; Manufacturing; Retail; Healthcare; Finance; and Education. The book also shares insights about the past, present, and future from leading experts and other industry veterans and innovators, including Sebastian Thrun, Ken Bretschneider, and Hugo Swart. They dive into what they think will happen in Spatial Computing in the near and medium term, and also explore what it could mean for humanity in the long term. The Infinite Retina then leaves it up to you to decide whether Spatial Computing is truly where the future of technology is heading or whether it's just an exciting, but passing, phase. What you will learn Look back at historical paradigms that changed the face of technology Consider how Spatial Computing could be the new technology that changes our lives See how Virtual and Augmented Reality will change the way we do healthcare Learn how Spatial Computing technology will lead to fully automated transportation Think about how Spatial Computing will change the manufacturing industry Explore how finance and

retail are going to be impacted through Spatial Computing devices Hear accounts from industry experts on what they expect Spatial Computing to bring to their sectors Who this book is for The Infinite Retina is for anyone interested in the future of technology and how Augmented Reality and Spatial Computing (among other developments) will affect both businesses and the individual.

Human-Computer Interaction

Principles and Practice

Digital Character Development

Digital Visual Culture

Hands-On System Programming with Linux

Design and Implementation of 3D Graphics Systems

"In this book, Vivek Kale makes an important contribution to the theory and practice of enterprise architecture ... this book captures the breadth and depth of information that a modern enterprise architecture must address to effectively support an agile enterprise. This book should have a place in every practicing architect's library." —John D. McDowall, Author of Complex Enterprise Architecture

Digital Transformation of Enterprise Architecture is the first book to propose Enterprise Architecture (EA) as the most important element (after Business Models) for digital transformation of enterprises. This book makes digital transformation more tangible by showing the rationale and typical technologies associated with it, and these technologies in turn reveal the essence of digital transformation. This book would be useful for analysts, designers and developers of future-ready agile application systems. This book proposes that it is the perennial quest for interoperability & portability, scalability, availability, etc., that has directed and driven the evolution of the IT/IS industry in the past 50 years. It is this very quest that has led to the emergence of technologies like service-oriented, cloud, and big data computing. In addition to the conventional attributes of EA like interoperability, scalability and availability, this book identifies additional attributes of mobility, ubiquity, security, analyticity, and usability. This pragmatic book: Identifies three parts effort for any digital transformation: Business Models, Enterprise Architectures and Enterprise Processes. Describes eight attributes of EA: interoperability, scalability, availability, mobility, ubiquity, security, analyticity, and usability. Explains the corresponding technologies of service-oriented, cloud, big data, context-aware, Internet of Things (IoT), blockchain, soft, and interactive computing. Briefs on auxiliary technologies like integration, virtualization, replication, spatio-temporal databases, embedded systems, cryptography, data mining, and interactive interfaces that are essential for digital transformation of enterprise architecture. Introduces interactive interfaces like voice, gaze, gesture and 3D interfaces. Provides an overview of blockchain computing, soft computing, and customer interaction systems. Digital Transformation of Enterprise Architecture proposes that to withstand the disruptive digital storms of the future, enterprises must bring about digital transformation, i.e. a transformation that affects an exponential change (amplification or attenuation) in any aspect of the

constituent attributes of EA. It proposes that each of these technologies (service-oriented, cloud, big data, context-aware, IoT, blockchain, soft, and interactive computing) bring about digital transformation of the corresponding EA attribute viz. interoperability, scalability, availability, mobility, ubiquity, security, analyticity, and usability.

This book constitutes the refereed proceedings of the 5th International Conference on Distributed, Ambient and Pervasive Interactions, DAPI 2017, held as part of the 19th International Conference on Human-Computer Interaction, HCII 2017, held in Vancouver, BC, Canada, in July 2017. The total of 1228 papers presented at the 15 colocated HCII 2017 conferences was carefully reviewed and selected from 4340 submissions. These papers address the latest research and development efforts and highlight the human aspects of design and use of computing systems. The papers accepted for presentation thoroughly cover the entire field of human-computer interaction, addressing major advances in knowledge and effective use of computers in a variety of application areas. This volume contains papers addressing the following major topics: designing and evaluating distributed, ambient and pervasive interactions; natural interaction; smart cities; art and cultural heritage in smart environments; smart environments for quality of life; smart environments for learning and creativity; and ambient games and humour.

The Essential Guide to Game Audio: The Theory and Practice of Sound for Games is a first of its kind textbook and must-have reference guide for everything you ever wanted to know about sound for games. This book provides a basic overview of game audio, how it has developed over time, and how you can make a career in this industry. Each chapter gives you the background and context you will need to understand the unique workflow associated with interactive media. The practical, easy to understand interactive examples provide hands-on experience applying the concepts in real world situations.

Designing Immersive 3D Experiences can help any visual designer move into the fast-growing fields of 3D and extended reality (XR) design. Leading designer Ren e Stevens (Powered by Design) introduces a proven approach and an effective design thinking process you can use to create outstanding, immersive user experiences. Stevens guides you through creating your first XR project - and improving every project after that. Drawing on her experience building a major university's first course in Augmented Reality, she prepares visual designers to succeed with 3D and XR design in environments from mobile and web to wearables. Stevens begins by exploring what XR and 3D immersive design are, how they're evolving, and how you may already be using them. Next, she explores core concepts and technologies, from computer-human interaction to projection mapping and head-mounted displays. Then, you'll walk through projects from start to finish, learning how to: Perform upfront ideation for new XR/3D projects: set "why" goals, balance innovation with practicality, and keep it all human Build seamless and approachable user experiences and interfaces Prototype XR experiences Account for perception and other human factors Augment

typography, color, audio, and voice Take your next steps with XR design, and more

UI is Communication

The Theory and Practice of Sound for Games

Advances in Artificial Intelligence: From Theory to Practice

Acquisition and Processing of Marine Seismic Data

Envisioning Holograms

An Empirical Research Perspective

Game Interface Design

This collection offers an expansive, multiplatform exploration of the rapidly-expanding area of motion design and motion graphics, taking into account both theoretical questions and creative professional practice. Spanning interaction design, product interfaces, kinetic data visualizations, typography, TV and film title design, brand building, narrative storytelling, history, exhibits and environments, editors R. Brian Stone and Leah Wahlin offer an interdisciplinary range of academic essays and professional interviews that together form a dialogue between motion design theory and professional practice. Written for both those critically engaged with motion design as well as those working or aspiring to work professionally in the field, the book features a range of international contributors and interviews with some of the best-known designers in the field, including Kyle Cooper, Karin Fong, and Daniel Alenquer. The Theory and Practice of Motion Design seeks to illuminate the diverse, interdisciplinary field of motion design by offering a structured examination of how motion design has evolved, what forces define our current understanding and implementation of motion design, and how we can plan for and imagine the future of motion design as it unfolds.

"Hackos and Redish wisely offer us the three things we most need about user and task analysis: practical advice, practical advice, and practical advice." -Ben Shneiderman, University of Maryland "This book is well written, thorough, and loaded with techniques, examples, and resources that bring analysis to everyone." -Marcia L. Conner, Director of Usability & Learnability PeopleSoft, Inc. User and Task Analysis for Interface Design helps you design a great user interface by focusing on the most important step in the process -the first one. You learn to go out and observe your users at work, whether they are employees of your company or people in customer organizations. You learn to find out what your users really need, not by asking them what they want, but by going through a process of understanding what they are trying to accomplish. JoAnn Hackos and Janice (Ginny) Redish, internationally known experts in usable design, take you through a step-by-step process to conduct a user and task analysis. You learn: *

- How interface designers use user and task analysis to build successful interfaces**
- * Why knowledge of users, their tasks, and their environments is critical to successful design**
- * How to prepare and set up your site visits**
- * How to select and train your user and task analysis team**
- * What observations to make, questions to ask, and questions to avoid**
- * How to record and report what you have learned to your development team members**
- * How to turn the information you've gathered into design ideas**
- * How to create paper prototypes of your interface design**
- * How to conduct usability tests with your prototypes to find out if you're on the right track.**

This book includes many examples of design successes and challenges for products of every kind.

3D Audio offers a detailed perspective of this rapidly developing arena. Written by many of the world's leading researchers and practitioners, it draws from science, technologies, and creative practice to provide insight into cutting-edge research in 3D audio. Through exploring the intersection of these fields, the reader will gain insight into a number of research areas and professional practice in 3D sonic space. As such, the book acts both as a primer that enables readers to gain an understanding of various aspects of 3D audio, and can inform students and audio enthusiasts, but its deep treatment of a diverse range of topics will also inform professional practitioners and academics beyond their core specialisms. The chapters cover areas such as an

Ambisonics, binaural technologies and approaches, psychoacoustics, 3D audio recording, composition for 3D space, 3D audio in live sound, broadcast, and movies – and more. Overall, this book offers a definitive insight into an emerging sound world that is increasingly becoming part of our everyday lives.

Augmented & mixed reality, gestural, 3d en multisensory interfaces.

Theory and Practice

30th International Conference on Industrial Engineering and Other Applications of Applied Intelligent Systems, IEA/AIE 2017, Arras, France, June 27-30, 2017, Proceedings, Part II

Search User Interfaces

Computer Graphics

User and Task Analysis for Interface Design

How to Design Intuitive, User Centered Interfaces by Focusing on Effective Communication

Interaction Design for 3D User Interfaces

The Complete, Up-To-Date Guide to Building Great 3D User Interfaces for Any Application 3D interaction is suddenly everywhere. But simply using 3D input or displays isn't enough: 3D interfaces must be carefully designed for optimal user experience. 3D User Interfaces: Theory and Practice, Second Edition is today's most comprehensive primary reference to building state-of-the-art 3D user interfaces and interactions. Five pioneering researchers and practitioners cover the full spectrum of emerging applications, techniques, and best practices. The authors combine theoretical foundations, analysis of leading devices, and empirically validated design guidelines. This edition adds two new chapters on human factors and general human-computer interaction--indispensable foundational knowledge for building any 3D user interface. It also demonstrates advanced concepts at work through two running case studies: a first-person VR game and a mobile augmented reality application. Coverage Includes 3D user interfaces: evolution, elements, and roadmaps Key applications: virtual and augmented reality (VR, AR), mobile/wearable devices What 3D UI designers should know about human sensory systems and cognition ergonomics How proven human-computer interaction techniques apply to 3D UIs 3D UI output hardware for visual, auditory, and haptic/ tactile systems Obtaining 3D position, orientation, and motion data for users in physical space 3D object selection and manipulation Navigation and wayfinding techniques for moving through virtual and physical spaces Changing application state with system control techniques, issuing commands, and enabling other forms of user input Strategies for choosing, developing, and evaluating 3D user interfaces Utilizing 2D, "magic," "natural," multimodal, and two-handed interaction The future of 3D user interfaces: open research problems and emerging technologies.

Acquisition and Processing of Marine Seismic Data demonstrates the main principles, required equipment, and suitable selection of parameters in 2D/3D marine seismic data acquisition, as well as theoretical principles of 2D marine seismic data processing and their practical implications. Featuring detailed datasets and examples, the book helps to relate theoretical background to real seismic data. This reference also contains important QC analysis methods and results both for data acquisition and marine seismic data processing. Acquisition and Processing of Marine Seismic Data is a valuable tool for researchers and students in geophysics, marine seismics, and seismic data, as well as for oil and gas exploration. Contains simple step-by-step diagrams of the methodology used in the processing of seismic data to demonstrate the theory behind the applications Combines theory and practice, including extensive noise, QC, and velocity analyses, as well as examples for beginners in the seismic operations market Includes simple illustrations to provide to the audience an easy understanding of the theoretical background Contains enhanced field data examples and applications

A guide to the concepts and applications of computer graphics covers such topics as interaction techniques, dialogue design, and user interface software.

Although life continues to become increasingly embedded with interactive computing services that make our lives easier, human-computer interaction (HCI) has not been given the attention it deserves in the education of software developers at the undergraduate level. Most entry-level HCI textbooks are

structured around high-level concepts and are not directly tied to the software development process. Filling this need, *Human-Computer Interaction: Fundamentals and Practice* supplies an accessible introduction to the entire cycle of HCI design and implementation—explaining the core HCI concepts behind each step. Designed around the overall development cycle for an interactive software product, it starts off by covering the fundamentals behind HCI. The text then quickly goes into the application of this knowledge. It covers the forming of HCI requirements, modeling the interaction process, designing the interface, implementing the resulting design, and evaluating the implemented product. Although this textbook is suitable for undergraduate students of computer science and information technology, it is accessible enough to be understood by those with minimal programming knowledge. Supplying readers with a firm foundation in the main HCI principles, the book provides a working knowledge of HCI-oriented software development. The core content of this book is based on the introductory HCI course (advanced junior or senior-level undergraduate) that the author has been teaching at Korea University for the past eight years. The book includes access to PowerPoint lecture slides as well as source code for the example applications used throughout the text.

Fundamentals and Practice

Distributed, Ambient and Pervasive Interactions

Human – Computer Interaction

Introduction to Computer Graphics with OpenGL ES

3D User Interfaces

3D Audio

A Designer's Guide to Creating Realistic 3D Experiences for Extended Reality

3D User Interfaces Theory and Practice, CourseSmart eTextbook Addison-Wesley

Despite popular forays into augmented and virtual reality in recent years, spatial computing still sits on the cusp of mainstream use. Developers, artists, and designers looking to enter this field today have few places to turn for expert guidance. In this book, Erin Pangilinan, Steve Lukas, and Vasanth Mohan examine the AR and VR development pipeline and provide hands-on practice to help you hone your skills. Through step-by-step tutorials, you'll learn how to build practical applications and experiences grounded in theory and backed by industry use cases. In each section of the book, industry specialists, including Timoni West, Victor Prisacariu, and Nicolas Meuleau, join the authors to explain the technology behind spatial computing. In three parts, this book covers: Art and design: Explore spatial computing and design interactions, human-centered interaction and sensory design, and content creation tools for digital art Technical development: Examine differences between ARKit, ARCore, and spatial mapping-based systems; learn approaches to cross-platform development on head-mounted displays Use cases: Learn how data and machine learning visualization and AI work in spatial computing, training, sports, health, and other enterprise applications

User interface design is a challenging, multi-disciplinary activity that requires understanding a wide range of concepts and techniques that are often subjective and even conflicting. Imagine how much it would help if there were a single perspective that you could use to simplify these complex issues down to a small set of objective principles. In *UI is Communication*, Everett McKay explains how to design intuitive user interfaces by focusing on effective human communication. A user interface is ultimately a conversation between users and technology. Well-designed user interfaces use the language of UI to communicate to users efficiently and naturally. They also recognize that there is an emotional human being at the other end of the interaction, so good user interfaces strive to make an emotional connection. Applying what you learn from *UI is Communication* will remove much of the mystic, subjectiveness, and complexity from user interface design, and help you make better design decisions with confidence. It's the perfect introduction to user interface design. Approachable, practical communication-based guide to interaction and visual design that you can immediately apply to projects to make solid design decisions quickly and confidently Includes design makeovers so you can see the concepts in

practice with real examples Communication-based design process ties everything from interaction to visual design together

In the last two decades, Tangible User Interfaces (TUIs) have emerged as a new interface type that interlinks the digital and physical worlds. Drawing upon users' knowledge and skills of interaction with the real non-digital world, TUIs show a potential to enhance the way in which people interact with and leverage digital information. However, TUI research is still in its infancy and extensive research is required in order to fully understand the implications of tangible user interfaces, to develop technologies that further bridge the digital and the physical, and to guide TUI design with empirical knowledge. This paper examines the existing body of work on Tangible User Interfaces. We start by sketching the history of tangible user interfaces, examining the intellectual origins of this field. We then present TUIs in a broader context, survey application domains, and review frameworks and taxonomies. We also discuss conceptual foundations of TUIs including perspectives from cognitive sciences, psychology, and philosophy. Methods and technologies for designing, building, and evaluating TUIs are also addressed. Finally, we discuss the strengths and limitations of TUIs and chart directions for future research.

Designing Immersive 3D Experiences

Design Strategies for Learning Experiences

Tangible User Interfaces

Interface Design for Learning

With Best Practice Business Analysis and User Interface Design Tips and Techniques

Brave NUI World

Practical Algorithms for 3D Computer Graphics, Second Edition

Digital characters are a driving force in the entertainment industry today. Every animated film and video game production spends a large percentage of its resources and time on advancing the quality of the digital characters inhabiting the world being created. This book presents the theory and practice behind the creation of digital characters for

Practical Algorithms for 3D Computer Graphics, Second Edition covers the fundamental algorithms that are the core of all 3D computer graphics software packages. Using Core OpenGL and OpenGL ES, the book enables you to create a complete suite of programs for 3D computer animation, modeling, and image synthesis. Since the publication of the first edition, implementation aspects have changed significantly, including advances in graphics technology that are enhancing immersive experiences with virtual reality. Reflecting these considerable developments, this second edition presents up-to-date algorithms for each stage in the creative process. It takes you from the construction of polygonal models of real and imaginary objects to rigid body animation and hierarchical character animation to the rendering pipeline for the synthesis of realistic images. New to the Second Edition New chapter on the modern approach to real-time 3D programming using OpenGL New chapter that

introduces 3D graphics for mobile devices New chapter on OpenFX, a comprehensive open source 3D tools suite for modeling and animation Discussions of new topics, such as particle modeling, marching cubes, and techniques for rendering hair and fur More web-only content, including source code for the algorithms, video transformations, comprehensive examples, and documentation for OpenFX The book is suitable for newcomers to graphics research and 3D computer games as well as more experienced software developers who wish to write plug-in modules for any 3D application program or shader code for a commercial games engine.

Digital creativity is boundless. Art practitioners and scholars continue to explore what technology has to offer and practice-based research is redefining their disciplines. What happens when an artist experiments with bio-scientific data and discovers something the scientists failed to notice? How do virtual telematic environments affect our relationship with the object and our understanding of identity and presence? Interactive engagement with the creative process takes precedence over the finite piece thus affecting the roles of the artist and the viewer. The experience of arts computing in.

Understanding Virtual Reality: Interface, Application, and Design, Second Edition, arrives at a time when the technologies behind virtual reality have advanced dramatically in their development and deployment, providing meaningful and productive virtual reality applications. The aim of this book is to help users take advantage of ways they can identify and prepare for the applications of VR in their field, whatever it may be. The included information counters both exaggerated claims for VR, citing dozens of real-world examples. By approaching VR as a communications medium, the authors have created a resource that will remain relevant even as the underlying technologies evolve. You get a history of VR, along with a good look at systems currently in use. However, the focus remains squarely on the application of VR and the many issues that arise in application design and implementation, including hardware requirements, system integration, interaction techniques and usability. Features substantive, illuminating coverage designed for technical or business readers and the classroom Examines VR's constituent technologies, drawn from

visualization, representation, graphics, human-computer interaction and other fields Provides (via a companion website) additional case studies, tutorials, instructional materials and a link to an open-source VR programming system Includes updated perception material and new sections on game engines, optical tracking, VR visual interface software and a new glossary with pictures

The Theory and Practice of Motion Design

Theory and Practice, CourseSmart eTextbook

Understanding Virtual Reality

Proxemic Interactions

Human-Centered Design for Virtual Reality

Design Breakthrough Experiences for Mixed Reality

The Infinite Retina

Get up and running with system programming concepts in Linux Key Features Acquire insight on Linux system architecture and its programming interfaces Get to grips with core concepts such as process management, signalling and pthreads Packed with industry best practices and dozens of code examples **Book Description** The Linux OS and its embedded and server applications are critical components of today's software infrastructure in a decentralized, networked universe. The industry's demand for proficient Linux developers is only rising with time. Hands-On System Programming with Linux gives you a solid theoretical base and practical industry-relevant descriptions, and covers the Linux system programming domain. It delves into the art and science of Linux application programming— system architecture, process memory and management, signaling, timers, pthreads, and file IO. This book goes beyond the use API X to do Y approach; it explains the concepts and theories required to understand programming interfaces and design decisions, the tradeoffs made by experienced developers when using them, and the rationale behind them. Troubleshooting tips and techniques are included in the concluding chapter. By the end of this book, you will have gained essential conceptual design knowledge and hands-on experience working with Linux system programming interfaces. What you will learn **Explore** the theoretical underpinnings of Linux system architecture **Understand** why modern OSes use virtual memory and dynamic memory APIs **Get to grips** with dynamic memory issues and effectively debug them **Learn** key concepts and powerful system APIs related to process management **Effectively** perform file IO and use signaling and timers **Deeply** understand multithreading concepts, pthreads APIs, synchronization and scheduling **Who this book is for** Hands-On System Programming with Linux is for Linux system engineers, programmers, or anyone who wants to go beyond using an API set to understanding the theoretical underpinnings and concepts behind powerful Linux system programming APIs. To get the most out of this book, you should be familiar with Linux at the user-level logging in, using shell via the command line interface, the ability to use tools such as find, grep, and sort. **Working** knowledge of the C programming

language is required. No prior experience with Linux systems programming is assumed.

Human-Computer Interaction: An Empirical Research Perspective is the definitive guide to empirical research in HCI. The book begins with foundational topics including historical context, the human factor, interaction elements, and the fundamentals of science and research. From there, you'll progress to learning about the methods for conducting an experiment to evaluate a new computer interface or interaction technique. There are detailed discussions and how-to analyses on models of interaction, focusing on descriptive models and predictive models. Writing and publishing a research paper is explored with helpful tips for success. Throughout the book, you'll find hands-on exercises, checklists, and real-world examples. This is your must-have, comprehensive guide to empirical and experimental research in HCI—an essential addition to your HCI library. Master empirical and experimental research with this comprehensive, A-to-Z guide in a concise, hands-on reference. Discover the practical and theoretical ins-and-outs of user studies. Find exercises, takeaway points, and case studies throughout.

The truly world-wide reach of the Web has brought with it a new realisation of the enormous importance of usability and user interface design. In the last ten years, much has become understood about what works in search interfaces from a usability perspective, and what does not. Researchers and practitioners have developed a wide range of innovative interface ideas, but only the most broadly acceptable make their way into major web search engines. This book summarizes these developments, presenting the state of the art of search interface design, both in academic research and in deployment in commercial systems. Many books describe the algorithms behind search engines and information retrieval systems, but the unique focus of this book is specifically on the user interface. It will be welcomed by industry professionals who design systems that use search interfaces as well as graduate students and academic researchers who investigate information systems.

In offices, colleges, and living rooms across the globe, learners of all ages are logging into virtual laboratories, online classrooms, and 3D worlds. Kids from kindergarten to high school are honing math and literacy skills on their phones and iPads. If that weren't enough, people worldwide are aggregating internet services (from social networks to media content) to learn from each other in "Personal Learning Environments." Strange as it sounds, the future of education is now as much in the hands of digital designers and programmers as it is in the hands of teachers. And yet, as interface designers, how much do we really know about how people learn? How does interface design actually impact learning? And how do we design environments that support both the cognitive and emotional sides of learning experiences? The answers have been hidden away in the research on education, psychology, and human computer interaction, until now. Packed with over 100 evidence-based strategies, in this book you'll learn how to: Design educational games, apps, and multimedia

interfaces in ways that enhance learning Support creativity, problem-solving, and collaboration through interface design Design effective visual layouts, navigation, and multimedia for online and mobile learning Improve educational outcomes through interface design.

UX Design and Usability Mentor Book

Spatial Computing, Augmented Reality, and how a collision of new technologies are bringing about the next tech revolution

5th International Conference, DAPI 2017, Held as Part of HCI International 2017, Vancouver, BC, Canada, July 9–14, 2017, Proceedings

The World of Modern Input Devices for Research, Applications, and Game Development

Explore Linux system programming interfaces, theory, and practice

Unity 2020 Virtual Reality Projects

Put Theory Into Practice

Atom Probe Tomography is aimed at beginners and researchers interested in expanding their expertise in this area. It provides the theoretical background and practical information necessary to investigate how materials work using atom probe microscopy techniques, and includes detailed explanations of the fundamentals, the instrumentation, contemporary specimen preparation techniques, and experimental details, as well as an overview of the results that can be obtained. This book emphasizes processes for assessing data quality and the proper implementation of advanced data mining algorithms. For those more experienced in the technique, this book will serve as a single comprehensive source of indispensable reference information, tables, and techniques. Both beginner and expert will value the way the book is set out in the context of materials science and engineering. In addition, its references to key research outcomes based upon the training program held at the University of Rouen—one of the leading scientific research centers exploring the various aspects of atom probe instrument—will further enhance understanding and the learning process. Provides an introduction to the capabilities and limitations of atom probe tomography when analyzing materials. Written for both experienced researchers and new users. Includes exercises, along with corrections, for users to practice the techniques discussed. Contains coverage of more advanced and less widespread techniques, such as correlative APT and STEM microscopy.

Explore the approach, techniques, and mindshift needed to design truly breakthrough experiences with the Microsoft HoloLens and Windows Mixed Reality platform. Learn what's so different about working with holograms, how to think spatially, and where to start designing your own hologram projects. You'll move rapidly from initial concept to persuasive prototype—all without the need for expensive tools or a designer's skill set. Designing for mixed reality is a completely new experience for everyone involved, and takes some experimentation to get right. You won't nail your first mixed reality project by relying upon your previous mobile or web design expertise as a guide. Mixed reality requires a different kind of design thinking for its unique challenges. Breakthrough holographic design starts with envisioning—the act of visualizing what could be. By rapidly depicting a design experience and trying out its real-world interactions, you can quickly turn your initial vision into a tangible example of innovative design. Envisioning Holograms digs into why holographic computing is the future, takes you through the mixed reality design process, and gets you ready to take advantage of its endless opportunities. Praise for the Book "Envisioning Holograms is a guidebook for designing our holographic future. You'll find the processes, techniques, and production tools necessary to design immersive products that will change how we work, play and communicate." – Tony L. Global Head of AR/VR for Unity. Industry legend. "Just as the pioneering work of E.S. Porter helped to define a new language for cinematic storytelling at the dawn of motion pictures, Envisioning Holograms provides us with the missing vocabulary and grammar to help define a new design language for this world-changing medium of Mixed Reality." – Ori Inbar, Founder and Managing

Partner for Super Ventures, an AR/VR fund. "An exceptional introduction to a new way of thinking about software. Envisioning Holograms is approachable to people just starting out, and also provides some excellent bits of insight to veterans that can help influence their creative process." – Luca Rizzotto, award-winning creator of Mixed Reality experiences. "Envisioning Holograms is the perfect book for VR/AR/MR studios that are struggling with application design. It is filled with strategies to acquire ideas, develop and iterate through scenes, and find the best fit. I highly recommend this book to anyone wanting to create solid user experiences using 3D interfaces and spatial computing." – Rick King, authority on the latest trends in AR, VR, and MR development. What You'll Learn

- Understand what makes mixed reality a challenging design space
- See how envisioning quickly and persuasively brings ideas to life
- Get to know your audience, medium, and palette
- Explore several innovative rapid envisioning techniques
- Identify the key elements of your own holographic user experience
- Design an engaging holographic experience from start to finish

Who This Book Is For

While aimed at those designing for Microsoft HoloLens and the Windows Holographic tool kit, the techniques in the book are equally applicable to those designing for other holographic hardware. This book is for the designer who is new to thinking in 3D and wants to quickly learn best practices, the developer who needs to do design work while building exciting new products for Microsoft HoloLens, and the marketer who has a great story to tell in this exciting new medium of mixed reality.

In the everyday world, much of what we do as social beings is dictated by how we perceive and manage our interpersonal space. This is called proxemics. At its simplest, people naturally correlate physical distance to social distance. We believe that people's expectations of proxemics can be exploited in interaction design to mediate their interactions with devices (phones, tablets, computers, appliances, large displays) contained within a small ubiquitous computing ecology. Just as people expect increasing engagement and intimacy as they approach others, so should they naturally expect increasing connectivity and interaction possibilities as they bring themselves and their devices into proximity to one another. This is called Proxemic Interactions. This book concerns the design of proxemic interactions within such future proxemic-aware ecologies. It imagines a world of devices that have fine-grained knowledge of nearby people and other devices—how they move into range, at what precise distance, their identity, and even their orientation—and how such knowledge can be exploited to design interaction techniques. The first part of this book concerns theory. After introducing proxemics, we operationalize proxemics for ubicomp interaction via the Proxemic Interactions framework that designers can use to mediate people's interactions with digital devices. The framework, in part, identifies five key dimensions of proxemic measures (distance, orientation, movement, identity, and location) to consider when designing proxemic-aware ubicomp systems. The second part of this book applies this theory to practice via three case studies of proxemic-aware systems that react continuously to people's and devices' proxemic relationships. The case studies explore the application of proxemics in small-space ubicomp ecologies by considering first person-to-device, then device-to-device, and finally person-to-person and device-to-device proxemic relationships. We also offer a critical perspective on proxemic interactions in the form of "danger patterns," where knowledge of proxemics may (and likely will) be easily exploited to the detriment of the user.

Virtual reality (VR) potentially provides our minds with direct access to digital media in a way that first seems to have no limits. However, creating compelling VR experiences is an incredibly complex challenge. When VR is done well, the results are brilliant and pleasurable experiences that go beyond what we can do in the real world. When VR is done badly, not only is the system frustrating to use, but sickness can result. Reasons for bad VR are numerous; some failures come from the limitations of the technology, but many come from a lack of understanding perception, interaction, design principles, and real users. This book discusses such issues, focusing upon the human element of VR rather than the technical implementation, for if we do not get the human element correct, then no amount of technological advancement will make VR anything more than an interesting tool confined to research laboratories. Even when VR principles are fully understood, first implementations are rarely novel and never

due to the complex nature of VR and the countless possibilities. However, the VR principles do within enable us to intelligently experiment with the rules and iteratively design towards innovative experiences.

Interface, Application, and Design

From Theory to Practice

The Essential Guide to Game Audio

Augmented Reality

Digital Transformation of Enterprise Architecture

Creating Augmented and Virtual Realities

Learn VR development by building immersive applications and games with Unity 2019.4 and later versions, 3rd Edition

Here's what three pioneers in computer graphics and human-computer interaction have to say about this book: "What a tour de force—everything one would want—comprehensive, encyclopedic, and authoritative." —Jim Foley "At last, a book on this important, emerging area. It will be an indispensable reference for the practitioner, researcher, and student interested in 3D user interfaces." —Andy van Dam "Finally, the book we need to bridge the dream of 3D graphics with the user-centered reality of interface design. A thoughtful and practical guide for researchers and product developers. Thorough review, great examples." —Ben Shneiderman As 3D technology becomes available for a wide range of applications, its successful deployment will require well-designed user interfaces (UIs). Specifically, software and hardware developers will need to understand the interaction principles and techniques peculiar to a 3D environment. This understanding, of course, builds on usability experience with 2D UIs. But it also involves new and unique challenges and opportunities. Discussing all relevant aspects of interaction, enhanced by instructive examples and guidelines, 3D User Interfaces comprises a single source for the latest theory and practice of 3D UIs. Many people already have seen 3D UIs in computer-aided design, radiation therapy, surgical simulation, data visualization, and virtual-reality entertainment. The next generation of computer games, mobile devices, and desktop applications also will feature 3D interaction. The authors of this book, each at the forefront of research and development in the young and dynamic field of 3D UIs, show how to produce usable 3D applications that deliver on their enormous promise. Coverage includes: The psychology and human factors of various 3D interaction tasks Different approaches for evaluating 3D UIs Results from empirical studies of 3D interaction techniques Principles for choosing appropriate input and output devices for 3D systems Details and tips on implementing common 3D interaction techniques Guidelines for selecting the most effective interaction techniques for common 3D tasks Case studies of 3D UIs in real-world applications To help you keep pace with this fast-evolving field, the book's Web site, www.3dui.org, will offer information and links to the latest 3D UI research and applications.

OpenGL ES is the standard graphics API used for mobile and embedded systems. Despite its widespread use, there is a lack of material that addresses the balance of both theory and practice in OpenGL ES.

JungHyun Han's Introduction to Computer Graphics with OpenGL ES achieves this perfect balance. Han's depiction of theory and practice

illustrates how 3D graphics fundamentals are implemented. Theoretical or mathematical details around real-time graphics are also presented in a way that allows readers to quickly move on to practical programming. Additionally, this book presents OpenGL ES and shader code on many topics. Industry professionals, as well as, students in Computer Graphics and Game Programming courses will find this book of importance. In this new era of computing, where the iPhone, iPad, Xbox Kinect, and similar devices have changed the way to interact with computers, many questions have risen about how modern input devices can be used for a more intuitive user interaction. Interaction Design for 3D User Interfaces: The World of Modern Input Devices for Research, Applications, a