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The VR Book

Human-Centered Design for Virtual Reality

Morgan & Claypool Virtual reality (VR) potentially provides our minds with direct access to digital media in a way that at 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 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 technical implementation, for if we do not get the human element correct, then no amount of technology 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 ideal due to the complex nature of VR and the countless possibilities. However, the VR principles discussed within enable us to intelligently experiment with the rules and iteratively design towards innovative experiences.

Virtual Reality Technology

John Wiley & Sons A groundbreaking Virtual Reality textbook is now even better Virtual reality is a very powerful and compelling computer application by which humans interact with computer-generated environments in a way that mimics real life and engages various senses. Although its most widely known application is in the entertainment industry, the real promise of virtual reality lies in such fields as medicine, engineering, oil exploration, and the military, to name just a few. Through virtual reality, scientists can triple the rate of oil discovery, pilots can dogfight numerically superior "bandits," and surgeons can improve their skills on virtual (rather than real) patients. This Second Edition of the first comprehensive technical book on virtual reality provides updated and expanded coverage of the technology such as: Input and output interfaces including touch and force feedback Computing architecture (with emphasis on the rendering pipeline and task distribution) Object modeling (including physical and behavioral aspects) Programming for virtual reality (WorldToolKit, Java 3D, GHOST, and PeopleShop) An in-depth look at human factors issues, user performance, and sensorial conflict aspects of VR Traditional and emerging VR applications The new edition of Virtual Reality Technology is specifically designed for use as a textbook. Thus, it includes definitions, review questions, and a CD-ROM with video clips that reinforce the topics covered. The CD-ROM also contains a Laboratory Manual with homework and programming assignments in VRML and Java 3D, as follows: Introduction to VRML and Java 3D Sensor and Event Processing VRML and JavaScript Scene Hierarchy, Geometry, and Texture VRML PROTO and Glove Devices Viewpoint Control, Sound, and Haptic Effects The Second Edition will serve as a state-of-the-art resource for both undergraduate and graduate students in engineering, computer science, and other disciplines.

Virtual Reality Technology and Applications

Springer Science & Business Media As virtual reality expands from the imaginary worlds of science fiction and pervades every corner of everyday life, it is becoming increasingly important for students and professionals alike to understand the diverse aspects of this technology. This book aims to provide a comprehensive guide to the theoretical and practical elements of virtual reality, from the mathematical and technological foundations of virtual worlds to the human factors and the applications that enrich our lives: in the fields of medicine, entertainment, education and others. After providing a brief introduction to the topic, the book describes the kinematic and dynamic mathematical models of virtual worlds. It explores the many ways a computer can track and interpret human movement, then progresses through the modalities that make up a virtual world: visual, acoustic and haptic. It explores the interaction between the actual and virtual environments, as well as design principles of the latter. The book closes with an examination of different applications, focusing on augmented reality as a special case. Though the content is primarily VR-related, it is also relevant for many other fields.

Augmented Reality and Virtual Reality

New Trends in Immersive Technology

Springer Nature This book features the latest research in the area of immersive technologies, presented at the 6th International Augmented Reality and Virtual Reality Conference, held in online in 2020. Bridging the gap between academia and industry, it presents the state of the art in augmented reality (AR) and virtual reality (VR) technologies and their applications in various industries such as marketing, education, health care, tourism, events, fashion, entertainment, retail and the gaming industry. The book is a collection of research papers by prominent AR and VR scholars from around the globe. Covering the most significant topics in the field of augmented and virtual reality and providing the latest findings, it is of interest to academics and practitioners alike.

Augmented Reality and Virtual Reality

The Power of AR and VR for Business

Springer This book presents a collection of the latest research in the area of immersive technologies, presented at the International Augmented and Virtual Reality Conference 2018 in Manchester, UK, and showcases how augmented reality (AR) and virtual reality (VR) are transforming the business landscape. Innovations in this field are seen as providing opportunities for businesses to offer their customers unique services and experiences. The papers gathered here advance the state of the art in AR/VR technologies and their applications in various industries such as healthcare, tourism, hospitality, events, fashion, entertainment, retail, education and gaming. The volume collects contributions by prominent computer and social sciences experts from around the globe. Addressing the most significant topics in the field of augmented and virtual reality and sharing the latest findings, it will be of interest to academics and practitioners alike.

Virtual Reality and Augmented Reality

17th EuroVR International Conference, EuroVR 2020, Valencia, Spain, November 25–27, 2020, Proceedings

Springer Nature This book constitutes the refereed proceedings of the 17th International Conference on Virtual Reality and Augmented Reality, EuroVR 2020, held in Valencia, Spain, in November 2020. The 12 full papers were carefully reviewed and selected from 35 submissions. The papers are organized in topical sections named: Perception, Cognition and Behaviour; Training, Teaching and Learning; Tracking and Rendering; and Scientific Posters.

Reality Media

Augmented and Virtual Reality

MIT Press How augmented reality and virtual reality are taking their places in contemporary media culture alongside film and television. T This book positions augmented reality (AR) and virtual reality (VR) firmly in contemporary media culture. The authors view AR and VR not as the latest hyped technologies but as media—the latest in a series of what they term “reality media,” taking their places alongside film and television. Reality media inserts a layer of media between us and our perception of the world; AR and VR do not replace reality but refashion a reality for us. Each reality medium mediates and remediates; each offers a new representation that we implicitly compare to our experience of the world in itself but also through other media. The authors show that as forms of reality media emerge, they not only chart a future path for media culture, but also redefine media past. With AR and VR in mind, then, we can recognize their precursors in eighteenth-century panoramas and the Broadway lights of the 1930s. A digital version of Reality Media, available through the book’s website, invites readers to visit a series of virtual rooms featuring interactivity, 3-D models, videos, images, and texts that explore the themes of the book.

Virtual Reality

MIT Press A comprehensive overview of developments in augmented reality, virtual reality, and mixed reality—and how they could affect every part of our lives. After years of hype, extended reality—augmented reality (AR), virtual reality (VR), and mixed reality (MR)—has entered the mainstream. Commercially available, relatively inexpensive VR headsets transport wearers to other realities—fantasy worlds, faraway countries, sporting events—in ways that even the most ultra-high-definition screen cannot. AR glasses receive data in visual and auditory forms that are more useful than any laptop or smartphone can deliver. Immersive MR environments blend physical and virtual reality to create a new reality. In this volume in the MIT Press Essential Knowledge series, technology writer Samuel Greengard offers an accessible overview of developments in extended reality, explaining the technology, considering the social and psychological ramifications, and discussing possible future directions. Greengard describes the history and technological development of augmented and virtual realities, including the latest research in the field, and surveys the various shapes and forms of VR, AR, and MR, including head-mounted displays, mobile systems, and goggles. He examines the way these technologies are shaping and reshaping some professions and industries, and explores how extended reality affects psychology, morality, law, and social constructs. It's not a question of whether extended reality will become a standard part of our world, he

argues, but how, when, and where these technologies will take hold. Will extended reality help create a better world? Will it benefit society as a whole? Or will it merely provide financial windfalls for a select few? Greengard's account equips us to ask the right questions about a transformative technology.

Virtual and Augmented Reality (VR/AR)

Foundations and Methods of Extended Realities (XR)

Springer This comprehensive textbook offers a scientifically sound and at the same time practical introduction to Virtual and Augmented Reality (VR/AR). Readers will gain the theoretical foundation needed to design, implement or enhance VR/AR systems, evaluate and improve user interfaces and applications using VR/AR methods, assess and enrich user experiences, and develop a deeper understanding of how to apply VR/AR techniques. Whether utilizing the book for a principal course of study or reference reading, students of computer science, education, media, natural sciences, engineering and other subject areas can benefit from its in-depth content and vivid explanation. The modular structure allows selective sequencing of topics to the requirements of each teaching unit and provides an easy-to-use format from which to choose specific themes for individual self-study. Instructors are provided with extensive materials for creating courses as well as a foundational text upon which to build their advanced topics. The book enables users from both research and industry to deal with the subject in detail so they can properly assess the extent and benefits of VR/AR deployment and determine required resources. Technology enthusiasts and professionals can learn about the current status quo in the field of VR/AR and interested newcomers can gain insight into this fascinating world. Grounded on a solid scientific foundation, this textbook, addresses topics such as perceptual aspects of VR/AR, input and output devices including tracking, interactions in virtual worlds, real-time aspects of VR/AR systems and the authoring of VR/AR applications in addition to providing a broad collection of case studies.

Virtual & Augmented Reality For Dummies

John Wiley & Sons An easy-to-understand primer on Virtual Reality and Augmented Reality Virtual Reality (VR) and Augmented Reality (AR) are driving the next technological revolution. If you want to get in on the action, this book helps you understand what these technologies are, their history, how they’re being used, and how they’ll affect consumers both personally and professionally in the very near future. With VR and AR poised to become mainstream within the next few years, an accessible book to bring users up to speed on the subject is sorely needed—and that’s where this handy reference comes in! Rather than focusing on a specific piece of hardware (HTC Vive, Oculus Rift, iOS ARKit) or software (Unity, Unreal Engine), Virtual & Augmented Reality For Dummies offers a broad look at both VR and AR, giving you a bird’s eye view of what you can expect as they continue to take the world by storm. * Keeps you up-to-date on the pulse of this fast-changing technology * Explores the many ways AR/VR are being used in fields such as healthcare, education, and entertainment * Includes interviews with designers, developers, and technologists currently working in the fields of VR and AR Perfect for both potential content creators and content consumers, this book will change the way you approach and contribute to these emerging technologies.

Virtual Reality in Medicine

Springer Science & Business Media Virtual Reality has the potential to provide descriptive and practical information for medical training and therapy while relieving the patient or the physician. Multimodal interactions between the user and the virtual environment facilitate the generation of high-fidelity sensory impressions, by using not only visual and auditory, but also kinesthetic, tactile, and even olfactory feedback modalities. On the basis of the existing physiological constraints, Virtual Reality in Medicine derives the technical requirements and design principles of multimodal input devices, displays, and rendering techniques. Resulting from a course taught by the authors, Virtual Reality in Medicine presents examples for surgical training, intra-operative augmentation, and rehabilitation that are already in use as well as those currently in development. It is well suited as introductory material for engineering and computer science students, as well as researchers who want to learn more about basic technologies in the area of virtual reality applied to medicine. It also provides a broad overview to non-engineering students as well as clinical users, who desire to learn more about the current state of the art and future applications of this technology.

Virtual Reality: Concepts and Technologies

CRC Press A manual for both designers and users, comprehensively presenting the current state of experts' knowledge on virtual reality (VR) in computer science, mechanics, optics, acoustics, physiology, psychology, ergonomics, ethics, and related area. Designed as a reference book and design guide to help the reader develop a VR project, it presents the read

Augmented and Virtual Reality in Libraries

Rowman & Littlefield This book is written for librarians, by librarians: understanding that diverse communities use libraries, museums, and archives for a variety of different reasons. It makes augmented reality, virtual reality, and mixed reality applications much more accessible to professionals in libraries, museums, and archives.

Practical Augmented Reality

A Guide to the Technologies, Applications, and Human Factors for AR and VR

Addison-Wesley Professional The most comprehensive and up-to-date guide to the technologies, applications and human factors considerations of Augmented Reality (AR) and Virtual Reality (VR) systems and wearable computing devices. Practical Augmented Reality is ideal for practitioners and students concerned with any application, from gaming to medicine. It brings together comprehensive coverage of both theory and practice, emphasizing leading-edge displays, sensors, and DIY tools that are already available commercially or will be soon. Beginning with a Foreword by NASA research scientist Victor Luo, this guide begins by explaining the mechanics of human sight, hearing and touch, showing how these perceptual mechanisms (and their performance ranges) directly dictate the design and use of wearable displays, 3-D audio systems, and tactile/force feedback devices. Steve Aukstakalnis presents revealing case studies of real-world applications from gaming, entertainment, science, engineering, aeronautics and aerospace, defense, medicine, telerobotics, architecture, law enforcement, and geophysics. Readers will find clear, easy-to-understand explanations, photos, and illustrations of devices including the Atheer AiR, HTC Vive, DAQRI Smart Helmet, Oculus (Facebook) CV1, Sony PlayStation VR, Vuzix M300, Google Glass, and many more. Functional diagrams and photographs clearly explain how these devices operate, and link directly to relevant theoretical and practical content. Practical Augmented Reality thoroughly considers the human factors of these systems, including sensory and motor physiology constraints, monocular and binocular depth cues, elements contributing to visually-induced motion sickness and nausea, and vergence–accommodation conflicts. It concludes by assessing both the legal and societal implications of new and emerging AR, VR, and wearable technologies as well as provides a look next generation systems.

New Perspectives on Virtual and Augmented Reality

Finding New Ways to Teach in a Transformed Learning Environment

Routledge New Perspectives on Virtual and Augmented Reality discusses the possibilities of using virtual and augmented reality in the role of innovative pedagogy, where there is an urgent need to find ways to teach and support learning in a transformed learning environment. Technology creates opportunities to learn differently and presents challenges for education. Virtual reality solutions can be exciting, create interest in learning, make learning more accessible and make learning faster. This book analyses the capabilities of virtual, augmented and mixed reality by providing ideas on how to make learning more effective, how existing VR/AR solutions can be used as learning tools and how a learning process can be structured. The virtual reality (VR) solutions can be used successfully for educational purposes as their use can contribute to the construction of knowledge and the development of metacognitive processes. They also contribute to inclusive education by providing access to knowledge that would not otherwise be available. This book will be of great interest to academics, researchers and post-graduate students in the field of educational technology.

Learning Virtual Reality

Developing Immersive Experiences and Applications for Desktop, Web, and Mobile

"O'Reilly Media, Inc." As virtual reality approaches mainstream consumer use, a vibrant development ecosystem has emerged in the past few years. This hands-on guide takes you through VR development essentials for desktop, mobile, and browser-based applications. You'll explore the three go-to platforms—OculusVR, Gear VR, and Cardboard VR—as well as several VR development environments, programming tools, and techniques. If you're an experienced programmer familiar with mobile development, this book will help you gain a working knowledge of VR development through clear and simple examples. Once you create a complete application in the final chapter, you'll have a jumpstart on the next major entertainment medium. Learn VR basics for UI design, 3D graphics, and stereo rendering Explore Unity3D, the current development choice among game engines Create native applications for desktop computers with the Oculus Rift Develop mobile applications for Samsung's Gear VR with the Android and Oculus Mobile SDKs Build browser-based applications with the WebVR Javascript API and WebGL Create simple and affordable mobile apps for any smartphone with Google's Cardboard VR Bring everything together to build a 360-degree panoramic photo viewer

Virtual Reality & Augmented Reality in Industry

Springer Science & Business Media "Virtual Reality & Augmented Reality in Industry" collects the proceedings of the 2nd Sino-German Workshop on the same topic held in Shanghai on April 16-17, 2009. The papers focus on the latest Virtual Reality (VR) / Augmented Reality (AR) technology and its application in industrial processes and presents readers with innovative methods, typical case studies

and the latest information on VR/AR basic research results and industrial applications, such as 3D rendering, innovative human-machine design, VR/AR methodology and new tools for assisting in industry, virtual assembly, virtual factory, training and education, etc. The book is intended for computer scientists, IT engineers as well as researchers in Mechanical Engineering. Dr. Dengzhe Ma and Dr. Xiumin Fan are both professors at Shanghai Jiao Tong University, China; Dr.-Ing. Jürgen Gausemeier is a professor of Computer-Integrated Manufacturing at the Heinz Nixdorf Institute, University of Paderborn, Germany; Dipl.-Ing. Michael Grafe is a senior engineer in the Product Engineering Research Group at the Heinz Nixdorf Institute, University of Paderborn.

Current and Prospective Applications of Virtual Reality in Higher Education

IGI Global For the last decade, virtual reality has been utilized in diverse fields such as entertainment, medicine, and industry. Recently, virtual reality has been applied in educational settings in order to transform student learning and experiences through such methods as building prototypes using digital devices or exploring new cultures through immersive interactions. Teachers who can incorporate virtual reality into their classrooms can provide their students with more meaningful learning experiences and can witness higher engagement. Current and Prospective Applications of Virtual Reality in Higher Education is a cutting-edge academic research book that provides comprehensive research on the integration of virtual reality in education programs and establishes foundations for course design, program development, and institutional strategic planning. The book covers an overall understanding and approach to virtual reality in education, specific applications of using virtual reality in higher education, and prospects and issues of virtual reality in the future. Highlighting a wide range of topics such as gamification, teacher training, and virtual reality, this book is ideal for teachers, instructional designers, curriculum developers, academicians, program developers, administrators, educational software developers, policymakers, researchers, education professionals, and students.

Virtual Reality for Beginners!

How to Understand, Use & Create With Vr

Createspace Independent Publishing Platform Virtual Reality for Beginners! How to Understand, Use & Create with VR Are You Ready To Learn All About VR? If So You've Come To The Right Place... Here's A Preview Of What This Virtual Reality Book Contains... An Introduction To Virtual Reality VR Through Time - The History And Growth Of Virtual Reality Getting Started With VR - What You'll Need To Get Going The Science of VR Trends In The VR Industry Google Cardboard Explored Sony PlayStation VR Explored HTC Vive Explored Oculus Rift Explored Samsung Gear VR Explored Bonus: Google Daydream View Explored VR And Beyond! 2016+ Verdict The Next Big Thing And Much, Much More! Download Your Copy Now And Get Started Now!

Emerging Tools and Applications of Virtual Reality in Education

IGI Global Virtual reality is the next frontier of communication. As technology exponentially evolves, so do the ways in which humans interact and depend upon it. It only follows that to educate and stimulate the next generation of industry leaders, one must use the most innovative tools available. By coupling education with the most immersive technology available, teachers may inspire students in exciting new ways. Emerging Tools and Applications of Virtual Reality in Education explores the potential and practical uses of virtual reality in classrooms with a focus on pedagogical and instructional outcomes and strategies. This title features current experiments in the use of augmented reality in teaching and highlights the effects it had on students. The authors also illustrate the use of technology in teaching the humanities, as students well-rounded in the fields of technology and communication are covetable in the workforce. This book will inspire educators, administrators, librarians, students of education, and virtual reality software developers to push the limits of their craft.

Understanding Virtual Reality

Interface, Application, and Design

Morgan Kaufmann 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

Virtual Reality for Physical and Motor Rehabilitation

Springer While virtual reality (VR) has influenced fields as varied as gaming, archaeology and the visual arts, some of its most promising applications come from the health sector. Particularly encouraging are the many uses of VR in supporting the recovery of motor skills following accident or illness. Virtual Reality for Physical and Motor Rehabilitation reviews two decades of progress and anticipates advances to come. It offers current research on the capacity of VR to evaluate, address, and reduce motor skill limitations and the use of VR to support motor and sensorimotor function, from the most basic to the most sophisticated skill levels. Expert scientists and clinicians explain how the brain organizes motor behavior, relate therapeutic objectives to client goals and differentiate among VR platforms in engaging the production of movement and balance. On the practical side, contributors demonstrate that VR complements existing therapies across various conditions such as neurodegenerative diseases, traumatic brain injury and stroke. Included among the topics: Neuroplasticity and virtual reality. Vision and perception in virtual reality. Sensorimotor recalibration in virtual environments. Rehabilitative applications using VR for residual impairments following stroke. VR reveals mechanisms of balance and locomotor impairments. Applications of VR technologies for childhood disabilities. A resource of great immediate and future utility, Virtual Reality for Physical and Motor Rehabilitation distills a dynamic field to aid the work of neuropsychologists, rehabilitation specialists (including physical, speech, vocational and occupational therapists), and neurologists.

Experience on Demand: What Virtual Reality Is, How It Works, and What It Can Do

W. W. Norton & Company “If you want to understand the most immersive new communications medium to come along since cinema… I’d suggest starting with Mr. Bailenson’s [book].” —Wall Street Journal Virtual reality is able to effectively blur the line between reality and illusion, granting us access to any experience imaginable. These experiences, ones that the brain is convinced are real, will soon be available everywhere. In Experience on Demand, Jeremy Bailenson draws upon two decades spent researching the psychological effects of VR to help readers understand its upsides and possible downsides. He offers expert guidelines for interacting with VR, and describes the profound ways this technology can be put to use to hone our performance, help us recover from trauma, improve our learning, and even enhance our empathic and imaginative capacities so that we treat others and ourselves better.

Virtual, Augmented Reality and Serious Games for Healthcare 1

Springer Science & Business There is a tremendous interest among researchers for the development of virtual, augmented reality and games technologies due to their widespread applications in medicine and healthcare. To date the major applications of these technologies include medical simulation, telemedicine, medical and healthcare training, pain control, visualisation aid for surgery, rehabilitation in cases such as stroke, phobia and trauma therapies. Many recent studies have identified the benefits of using Virtual Reality, Augmented Reality or serious games in a variety of medical applications. This research volume on Virtual, Augmented Reality and Serious Games for Healthcare 1 offers an insightful introduction to the theories, development and applications of virtual, augmented reality and digital games technologies in medical and clinical settings and healthcare in general. It is divided into six sections: section one presents a selection of applications in medical education and healthcare management; Section two relates to the nursing training, health literacy and healthy behaviour; Section three presents the applications of Virtual Reality in neuropsychology; Section four includes a number of applications in motor rehabilitation; Section five aimed at therapeutic games for various diseases; and the final section presents the applications of Virtual Reality in healing and restoration. This book is directed to the healthcare professionals, scientists, researchers, professors and the students who wish to explore the applications of virtual, augmented reality and serious games in healthcare further.

Augmented Reality

Where We Will All Live

Springer This book provides an in-depth exploration of the field of augmented reality (AR) in its entirety and sets out to distinguish AR from other inter-related technologies like virtual reality (VR) and mixed reality (MR). The author presents AR from its initial philosophies and early developments, to its current technologies and its impact on our modern society, to its possible future developments; providing readers with the tools to understand issues relating to defining, building, and using our perception of what is represented in our perceived reality, and ultimately how we assimilate and react to this information. Augmented Reality: Where We Will All Live can be used as a comprehensive guide to the field of AR and provides valuable insights for technologists, marketers, business managers, educators and academics who are interested in the field of augmented reality; its concepts, history, practices and the science behind this rapidly advancing field of research and development.

Cases on Immersive Virtual Reality Techniques

IGI Global As virtual reality approaches mainstream consumer use, new research and innovations in the field have impacted how we view and can use this technology across a wide range of industries. Advancements in this technology have led to recent breakthroughs in sound, perception, and visual processing that take virtual reality to new dimensions. As such, research is needed to support the adoption of these new methods and applications. Cases on Immersive Virtual Reality Techniques is an essential reference source that discusses new applications of virtual reality and how they can be integrated with immersive techniques and computer resources. Featuring research on topics such as 3D modeling, cognitive load, and motion cueing, this book is ideally designed for educators, academicians, researchers, and students seeking coverage on the applications of collaborative virtual environments.

Virtual Reality, Training’s Future?

Perspectives on Virtual Reality and Related Emerging Technologies

Springer Science & Business Media In 1988, the NATO panel governing human sciences (Panel 8 on Defence Applica of Human and Bio-Medical Sciences) established a Research Study Group to synthe tions size information relevant to Advanced Technologies Applied to Training Design. During its first phase, the RSG established an active exchange of information on advanced tech nologies applied to training design and stimulated much military application of these tech nologies. With the increased emphasis on training throughout the alliance, Panel 8, during its April 1991 meeting decided to continue with Phase II of this RSG focusing in the area of advanced training technologies that were emerging within the alliance. In order to ac complish its mission, the RSG held a series of workshops. Leaders in technology and training were brought together and exchanged information on the latest developments in technologies applicable to training and education. This volume represents the last in a se ries based on the NATO workshops. In Part One, it details findings from the last work shop, Virtual Reality for Training; and in Part Two, we provide a summary perspective on Virtual Reality and the other emerging technologies previously studied. These include computer-based training, expert systems, authoring systems, cost-effectiveness, and dis tance learning. It is a natural extension to proceed from learning without boundaries to virtual envi ronments. From the extended classroom to the individual or team immersion in a distrib uted, virtual, and collaborative environment is an easy conceptual step.

Developing Virtual Reality Applications

Foundations of Effective Design

Morgan Kaufmann Virtual Reality systems enable organizations to cut costs and time, maintain financial and organizational control over the development process, digitally evaluate products before having them created, and allow for greater creative exploration. In this book, VR developers Alan Craig, William Sherman, and Jeffrey Will examine a comprehensive collection of current,unique, and foundational VR applications in a multitude of fields, such as business, science, medicine, art, entertainment, and public safety among others. An insider’s view of what works, what doesn’t work, and why, Developing Virtual Reality Applications explores core technical information and background theory as well as the evolution of key applications from their genesis to their most current form. Developmental techniques are cross-referenced between different applications linking information to describe overall VR trends and fundamental best practices. This synergy, coupled with the most up to date research being conducted, provides a hands-on guide for building applications, and an enhanced, panoramic view of VR development. Developing Virtual Reality Applications is an indispensable one-stop reference for anyone working in this burgeoning field. Dozens of detailed application descriptions provide practical ideas for VR development in ALL areas of interest! Development techniques are cross referenced between different application areas, providing fundamental best practices!

Virtual Reality

The Revolutionary Technology of Computer-Generated Artificial Worlds-And How It Promises to Transform Society

Touchstone Books Discusses a new interactive computer technology that creates the illusion of being immersed in an artificial world that exists only in the computer, and examines the remarkable future implications of virtual reality technology

Extended Reality in Practice

100+ Amazing Ways Virtual, Augmented and Mixed Reality Are Changing Business and Society

John Wiley & Sons EXTENDED REALITY IN PRACTICE As one of the leading business trends today, extended reality (XR) promises to revolutionize the way consumers experience their encounters with brands and products of all kinds. Top brands from Pepsi and Uber to Boeing and the U.S. Army are creating immersive digital experiences that capture the interest and imaginations of their target markets. In Extended Reality in Practice: 100+ Amazing Ways Virtual, Augmented and Mixed Reality are Changing Business and Society, celebrated futurist, technologist, speaker, and author Bernard Marr delivers a robust and accessible explanation of how all kinds of firms are developing innovative XR solutions to business problems. You'll discover the new ways that companies are harnessing virtual, augmented, and mixed reality to improve consumers' perception of their brands. You'll also find out why there are likely to be no industries that will remain untouched by the use of XR, and why these technologies are popular across the commercial, governmental, and non-profit spectrums. Perfect for Chief Executive Officers, business owners, leaders, managers, and professionals working in business development, Extended Reality in Practice will also earn a place in the libraries of professionals working within innovation teams seeking an accessible resource on the possibilities and potential created by augmented, virtual, and mixed reality technologies. An insightful exploration of extended reality from a renowned thought leader, technologist, and futurist Extended Reality in Practice: 100+ Amazing Ways Virtual, Augmented and Mixed Reality are Changing Business and Society offers readers a front-row seat to one of the most exciting and impactful business trends to find traction in years. Celebrated futurist and author Bernard Marr walks you through the ins and outs of XR, or extended reality, and how it promises to revolutionize everything from the experience of walking through an airport or shopping mall to grabbing a burger at a fast-food restaurant. Discover insightful and illuminating case studies from businesses and organizations in a variety of industries, including Burger King, BMW, Boeing, and the U.S. Army, and see how they're turning virtual, mixed, and augmented reality experiences into big wins for their stakeholders. You'll also find out about how XR can help businesses tackle the problems of lackluster engagement and lukewarm customer loyalty with reinvigorated consumer experiences. Ideal for executives, founders, business leaders and owners, and professionals of all sorts, Extended Reality in Practice is an indispensable guide to an indispensable new technology. The book is the leading resource for anyone seeking a one-stop reference for augmented, virtual, and mixed reality tech and their limitless potential for enterprise.

Virtual Reality Insider

Guidebook for the VR Industry

Virtual reality is as explosive a technology as the Internet! Are you working in the VR industry, or curious to find out more about it? VR Insider is an overview and guidebook for consumer virtual reality. For the industry veteran, it is the perfect book to stir up new ideas and see how the big picture fits together. For newcomers to VR, it is the fastest way to catch up on what is happening and figure out how to apply your skills. Affordable virtual reality hardware finally exists, and this book will help you create its content! Best of all, this book is readable in 1-2 hours! 2nd Edition Update: A lot has changed in the 10 months since this book was published. This second edition adds 24 pages of new content, updating the information to the latest developments in VR, and incorporating the author's experience starting a VR content company. The time for VR is now!

Virtual Reality, Empathy and Ethics

Springer Nature This book examines the ethics of virtual reality (VR) technologies. New forms of virtual reality are emerging in society, not just from low-cost gaming headsets, or augmented reality apps on phones, but from simulated "deep fake" images and videos on social media. This book subjects the new VR technological landscape to ethical scrutiny: assessing the benefits, risks and regulatory practices that shape it. Though often associated with gaming, education and therapy, VR can also be used for moral enhancement. Journalists, artists, philanthropic and non-governmental organisations are using VR films, games and installations to stimulate user empathy to marginalised peoples through a combination of immersion, embodiment and persuasion. This book critically assesses the use of VR for empathy arousal and pro-social behaviour change, culminating in the development of a VR "ethical tool" – a device to facilitate reflective ethical judgement. Drawing upon the pragmatist philosophy of John Dewey, virtual reality is reshaped as "dramatic rehearsal". This book explains how a combination of immersive environment-building, moral imagination, choice architecture and reflective engagement can stimulate a future-focused and empathic ethics for users of the technology.

Storytelling for Virtual Reality

Methods and Principles for Crafting Immersive Narratives

Taylor & Francis Storytelling for Virtual Reality serves as a bridge between students of new media and professionals working between the emerging world of VR technology and the art form of classical storytelling. Rather than examining purely the technical, the text focuses on the narrative and how stories can best be structured, created, and then told in virtual immersive spaces. Author John Bucher examines the timeless principles of storytelling and how they are being applied, transformed, and transcended in Virtual

Reality. Interviews, conversations, and case studies with both pioneers and innovators in VR storytelling are featured, including industry leaders at LucasFilm, 20th Century Fox, Oculus, Insomniac Games, and Google. For more information about story, Virtual Reality, this book, and its author, please visit StorytellingforVR.com

Applications of Virtual Reality

BoD – Books on Demand Information Technology is growing rapidly. With the birth of high-resolution graphics, high-speed computing and user interaction devices Virtual Reality has emerged as a major new technology in the mid 90es, last century. Virtual Reality technology is currently used in a broad range of applications. The best known are games, movies, simulations, therapy. From a manufacturing standpoint, there are some attractive applications including training, education, collaborative work and learning. This book provides an up-to-date discussion of the current research in Virtual Reality and its applications. It describes the current Virtual Reality state-of-the-art and points out many areas where there is still work to be done. We have chosen certain areas to cover in this book, which we believe will have potential significant impact on Virtual Reality and its applications. This book provides a definitive resource for wide variety of people including academicians, designers, developers, educators, engineers, practitioners, researchers, and graduate students.

Communication in the Age of Virtual Reality

Routledge This volume addresses virtual reality (VR) -- a tantalizing communication medium whose essence challenges our most deeply held notions of what communication is or can be. The editors have gathered an expert team of engineers, social scientists, and cultural theorists for the first extensive treatment of human communication in this exciting medium. The first part introduces the reader to VR's state-of-the-art as well as future trends. In the next section, leading research scientists discuss how knowledge of communication can be used to build more effective and exciting communication applications of virtual reality. Looking ahead, the authors explore pioneering approaches to VR narratives, interpersonal communication, the use of 3D sound, and the building of VR entertainment complexes. In the final section, the authors zoom out to view the big picture -- the psychological, social, and cultural implications of virtual reality. Thought-provoking discussions consider important communication issues such as: * How will virtual reality influence perception of reality? * What are the legal issues defining communication in virtual reality? * What kind of cultural trends will this technology encourage?

Virtual Reality Systems

Academic Press This volume brings together a number of the leading practitioners and exponents in the field of virtual reality (VR), and explores some of the main issues in the area and its associated hardware and software technology. The main components of the current generation of virtual reality systems are outlined, and major developments of VR systems are discussed. * SPECIAL FEATURES * This volume brings together some of the leading practitioners and exponents in the field of VR, and explores some of the main issues in the area and its associated hardware and software technology. * The main components of the current generation of cirtual reality systems are outlined, and major developments of Vr systems are discussed, focussing of key areas such as hardware, software, techniques, application interfaces and ethical issues. * The book contains a comprehensive bibliography enabling the reader to follow up particular areas of specialism. It contains 16 pages of colour plates.

Medicine Meets Virtual Reality 22

NextMed / MMVR22

IOS Press In the early 1990s, a small group of individuals recognized how virtual reality (VR) could transform medicine by immersing physicians, students and patients in data more completely. Technical obstacles delayed progress but VR is now enjoying a renaissance, with breakthrough applications available for healthcare. This book presents papers from the Medicine Meets Virtual Reality 22 conference, held in Los Angeles, California, USA, in April 2016. Engineers, physicians, scientists, educators, students, industry, military, and futurists participated in its creative mix of unorthodox thinking and validated investigation. The topics covered include medical simulation and modeling, imaging and visualization, robotics, haptics, sensors, physical and mental rehabilitation tools, and more. Providing an overview of the state-of-the-art, this book will interest all those involved in medical VR and in innovative healthcare, generally.

Cases on Virtual Reality Modeling in Healthcare

IGI Global Virtual reality (VR) provides immersive stereoscopic visualization of virtual environments, and the visualization effect and computer graphics are critical to enhancing the engagement of participants and achieving optimal education and training effectiveness. Constructing realistic 3D models and scenarios for a specific application of VR simulation is no easy task. There are many different tools for 3D modeling. However, many of the modeling tools are used for manufacturing and product design applications and have advanced features and functions which may not be applicable to different levels of users and various specializations. Cases on Virtual Reality Modeling in Healthcare introduces the use of Blender for VR 3D modeling, demonstrates healthcare applications, and examines potential uses in modeling, dressing, and animation in healthcare. Covering a range of topics such as cross reality, rehabilitation games, and augmented reality, this book is ideal for engineers, industry professionals, practitioners, researchers, academicians, instructors, and students.

Defying Reality

The Inside Story of the Virtual Reality Revolution

Penguin A fascinating exploration of the history, development, and future of virtual reality, a technology with world-changing potential, written by award-winning journalist and author David Ewalt, stemming from his 2015 Forbes cover story about the Oculus Rift and its creator Palmer Luckey. You've heard about virtual reality, seen the new gadgets, and read about how VR will be the next big thing. But you probably haven't yet realized the extent to which this technology will change the way we live. We used to be bound to a physical reality, but new immersive computer simulations allow us to escape our homes and bodies. Suddenly anyone can see what it's like to stand on the peak of Mount Everest. A person who can't walk can experience a marathon from the perspective of an Olympic champion. And why stop there? Become a dragon and fly through the universe. But it's not only about spectacle. Virtual and augmented reality will impact nearly every aspect of our lives—commerce, medicine, politics—the applications are infinite. It may sound like science fiction, but this vision of the future drives billions of dollars in business and is a top priority for such companies as Facebook, Google, and Sony. Yet little is known about the history of these technologies. In Defying Reality, David M. Ewalt traces the story from ancient amphitheaters to Cold War military laboratories, through decades of hype and failure, to a nineteen-year-old video game aficionado who made the impossible possible. Ewalt looks at how businesses are already using this tech to revolutionize the world around us, and what we can expect in the future. Writing for a mainstream audience as well as for technology enthusiasts, Ewalt offers a unique perspective on VR. With firsthand accounts and on-the-ground reporting, Defying Reality shows how virtual reality will change our work, our play, and the way we relate to one another.

Virtual Reality and the Built Environment

Routledge This is the first text to focus on virtual reality applications for design of the built environment. This guide explores the use of virtual reality at the practical level. It provides an overview of industrial applications of virtual reality and explores relevant scientific research. Virtual Reality in the Built Environment is a guide to the practical uses of virtual design, construction, and management. Providing an overview of industrial applications for virtual reality and exploring relevant research, this book is an accessible and innovative resource for architects, designers and built environment professionals--bridging the gap between technological vision and current practice. Author Jennifer Whyte shows how interactive, spatial, real-time technologies can radically improve modelling and communication of ideas, enable partcipation in the design process, and facilitated planning and management at the urban scale. The experience of lead users of virtual reality is used as the basis for understanding its promise and problems. Explanations of the underlying principles of this exciting interactive medium, a discussion of the cognitive, technical and organizational issues it raises, and international case studies illustrating practical applications are all included in this guide. The author also provides a companion web site which provides online learning materials, including test-yourself questions, virtual reality models, and links to relevant sites, making it a valuable design resource and a stimulus for innovation.