Augmented Reality An Emerging Technologies Guide To Ar

Using mixed and augmented reality in communities is an emerging media practice that is reshaping how we interact with our cities and neighbors. From the politics of city hall to crosswalks and playgrounds, mixed and augmented reality will offer a diverse range of new ways to interact with our communities. In 2016, apps for augmented reality politics began to appear in app stores. Similarly, the blockbuster success of Pokémon Go illustrated how even forgotten street corners can become a magical space for play. In 2019, a court case in Milwaukee, Wisconsin, extended first amendment rights to augmented reality. For all the good that these emerging media provide, there will and have been consequences. Augmented and Mixed Reality for Communities will help students and practitioners navigate the ethical design and development of these kinds of experiences to transform their cities. As one of the first books of its kind, each chapter in the book prepares readers to contribute to the Augmented City. By providing insight into how these emerging media work, the book seeks to democratize the augmented and mixed reality space. Authors within this volume represent some of the leading scholars and practitioners working in the augmented and mixed reality space for civic media, cultural heritage, civic games, ethical design, and social justice. Readers will find practical insights for the design and development to create their own compelling experiences. Teachers will find that the text provides in-depth, critical analyses for thought-provoking classroom discussions.

Augmented Reality (AR) is the blending of digital information in a real-world environment. A common example can be seen during any televised football game, in which information about the game is digitally overlaid on the field as the players move and position themselves. Another application is Google Glass, which enables users to see AR graphics and information about their location and surroundings on the lenses of their "digital eyewear", changing in real-time as they move about. Augmented Reality Law, Privacy, and Ethics is the first book to examine the social, legal, and ethical issues surrounding AR technology. Digital eyewear products have very recently thrust this rapidly-expanding field into the mainstream, but the technology is so much more than those devices. Industry analysts have dubbed AR the "eighth mass medium" of communications. Science fiction movies have shown us the promise of this technology for decades, and now our capabilities are finally catching up to that vision. Augmented Reality will influence society as fundamentally as the Internet itself has done, and such a powerful medium cannot help but radically affect the laws and norms that govern society. No author is as uniquely qualified to provide a big-picture forecast and guidebook for these developments as Brian Wassom. A practicing attorney, he has been writing on AR law since 2007 and has established himself as the world's foremost thought leader on the intersection of law, ethics, privacy, and AR. Augmented Reality professionals around the world follow his Augmented Legality® blog. This book collects and expands upon the best ideas expressed in that blog, and sets them in the context of a big-picture forecast of how AR is shaping all aspects of society. Augmented reality thought-leader Brian Wassom provides you with insight into how AR is changing our world socially, ethically, and legally. Includes current examples, case studies, and legal cases from the frontiers of AR technology. Learn how AR is changing our world in the areas of

civil rights, privacy, litigation, courtroom procedure, addition, pornography, criminal activity, patent, copyright, and free speech. An invaluable reference guide to the impacts of this cutting-edge technology for anyone who is developing apps for it, using it, or affected by it in daily life.

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.

State-of-the-Art Virtual Reality and Augmented Reality Knowhow is a compilation of recent advancements in digital technologies embracing a wide arena of disciplines. Amazingly, this book presents less business cases of these emerging technologies, but rather showcases the scientific use of VR/AR in healthcare, building industry and education. VR and AR are known to be resource intensive, namely, in terms of hardware and wearables - this is covered in a chapter on head-mounted display (HMD). The research work presented in this book is of excellent standard presented in a very pragmatic way; readers will appreciate the depth and breadth of the methodologies and discussions about the findings. We hope it serves as a springboard for future research and development in VR/AR and stands as a lighthouse for the scientific community.

The increase in smartphone usage and new technologies embedded in smart devices have led to innovative developments and applications throughout a variety of industries. However, new techniques such as spatial augmented reality are becoming more affordable for business, allowing consumers to experience and interact with the world as they never have before. AR and VR have vast implications for management and can allow companies to increase their sustainability and reduce their CO2 footprint. Managerial Challenges and Social Impacts of Virtual and Augmented Reality is a pivotal reference source that provides vital research on the applications of VR, AR, and related technologies from the perspectives of managers and marketers in the industry and discusses the social impact of these technologies. While highlighting topics such as consumer analysis, privacy ethics, and relationship marketing, this book is ideally designed for managers, marketers, technology developers, managing directors, business professionals, academicians, students, and researchers seeking current studies on the evolution of interactive technology.

Design end-to-end AR solutions for domains such as marketing, retail, manufacturing, tourism, automation, and training Key Features Use leading AR development frameworks such as ARCore, ARKit, and Vuforia across key industries Identify the market potential of AR for designing visual solutions in different business sectors Build multi-platform AR projects for various platforms such as Unity, iOS, and Android Book Description Augmented reality (AR) is expanding its scope from just being used in mobile and game applications to enterprise. Different industries are using AR to enhance assembly line visualization, guide operators performing difficult tasks, attract more customers, and even improve training techniques. In this book, you'll gain comprehensive insights into different aspects of developing AR-based apps for six different enterprise sectors, focusing on market needs and choosing the most suitable tool in each case. You'll delve into the basics of Unity and get familiar with Unity assets, materials, and resources, which will help you build a strong foundation for working on the different AR projects covered in the book. You'll build real-world projects for various industries such as marketing, retail, and automation in a step-by-step manner. This will give you hands-on experience in developing your own industrial AR apps. While building the projects, you'll explore various AR frameworks used in the enterprise environment such as Vuforia, EasyAR, ARCore, and ARKit, and understand how they can be used by themselves or integrated into the Unity 3D engine to create AR markers, 3D models, and components of an AR app. By the end of this book, you'll be well versed in using different commercial AR frameworks as well as Unity for building robust AR projects. What you will learn Understand the basics of Unity application development and C# scripting Learn how to use Android Studio along with ARCore and Sceneform to build AR prototypes for Android devices Enable AR experiences on the web with ARCore and WebAR Explore emerging AR authoring tools such as Augmented Class! for education Understand the differences and similarities between handheld and head-mounted display (HMD) environments and how to build an app for each target Become well versed in using Xcode with ARKit and SceneKit to develop AR portals for iOS devices Who this book is for This book is for anyone interested in emerging and interactive technologies or looking to build AR applications for any domain. Although, no prior augmented reality experience is required, having some skills in object-oriented programming (OOP) will be helpful.

Augmented Reality (AR) blurs the boundary between the physical and digital worlds. In AR’s current exploration phase, innovators are beginning to create compelling and contextually rich applications that enhance a user’s everyday experiences. In this book, Dr. Helen Papagiannis—a world-leading expert in the field—introduces you to AR: how it’s evolving, where the opportunities are, and where it’s headed. If you’re a designer, developer, entrepreneur, student, educator, business leader, artist, or simply curious about AR’s possibilities, this insightful guide explains how you can become involved with an exciting, fast-moving technology. You’ll explore how: Computer vision, machine learning, cameras, sensors, and wearables change the way you see the world Haptic technology syncs what you see with how something feels Augmented sound and hearables alter the way you listen to your environment Digital smell and taste augment the way you share and receive information New approaches to storytelling immerse and engage users more deeply Users can augment their bodies with electronic textiles, embedded technology, and brain-controlled interfaces Human avatars can learn our behaviors and act on our behalf

Like virtual reality, augmented reality is becoming an emerging platform in new application areas for museums, edutainment, home entertainment, research, industry, and the art communities using novel approaches which have taken augmented reality beyond traditional eye-worn or hand-held displays. In this book, the authors discuss spatial augmented r

With the explosive growth in mobile phone usage and rapid rise in search engine technologies over the last decade, augmented reality (AR) is poised to be one of this decade's most disruptive technologies, as the information that is constantly flowing around us is brought into view, in real-time, through augmented reality. In this cutting-edge book, the authors outline and discuss never-before-published information about augmented reality and its capabilities. With coverage of mobile, desktop, developers, security, challenges, and gaming, this book gives you a comprehensive understanding of what augmented reality is, what it can do, what is in store for the future and most importantly: how to benefit from using AR in our lives and careers. Educates readers how best to use augmented reality regardless of industry Provides an in-depth understanding of AR and ideas ranging from new business applications to new crime fighting methods Includes actual examples and case studies from both private and government application

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.

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.

Virtual and augmented reality raise significant questions for law and policy. When should virtual world activities or augmented reality images count as protected First Amendment ‘speech’, and when are they instead a nuisance or trespass? When does copying them infringe intellectual property laws? When should a person (or computer) face legal consequences for allegedly harmful virtual acts? The Research Handbook on the Law of Virtual and Augmented Reality addresses these questions and others, drawing upon free speech doctrine, criminal law, issues of data protection and privacy, legal rights for increasingly intelligent avatars, and issues of jurisdiction within virtual and augmented reality worlds.

The Handbook of Listening is a comprehensive overview of the field of listening for advanced undergraduate students, graduate students, scholars, and practitioners. First comprehensive academic reference resource dedicated to listening Provides a broad, authoritative, cross-disciplinary overview of key methodological, conceptual, and theoretical issues in the field Covers methods; disciplinary foundations; teaching listening; contexts and applications; and emerging perspectives Original chapters written by a group of international scholars in the field of learning

In the fast-developing world of Industry 4.0, which combines Extended Reality (XR) technologies, such as Virtual Reality (VR) and Augmented Reality (AR), creating location aware applications to interact with smart objects and smart processes via Cloud Computing strategies enabled with Artificial Intelligence (AI) and the Internet of Things (IoT), factories and processes can be automated and machines can be enabled with self-monitoring capabilities. Smart objects are given the ability to analyze and communicate with each other and their human co-workers, delivering the opportunity for much smoother processes, and freeing up workers for other tasks. Industry 4.0 enabled smart objects can be monitored, designed, tested and controlled via their digital twins, and these processes and controls are visualized in VR/AR. The Industry 4.0 technologies provide powerful, largely unexplored application areas that will revolutionize the way we work, collaborate and live our lives. It is important to understand the opportunities and impact of the new technologies and the effects from a production, safety and societal point of view.

The emergent phenomena of virtual reality, augmented reality, and mixed reality is having an impact on ways people communicate with technology and with each other. Schools and higher education institutions are embracing these emerging technologies and implementing them at a rapid pace. The challenge, however, is to identify well-defined problems where these innovative technologies can support successful solutions and subsequently determine the efficacy of effective virtual learning environments. Emerging Technologies in Virtual Learning Environments is an essential scholarly research publication that provides a deeper look

into 3D virtual environments and how they can be developed and applied for the benefit of student learning and teacher training. This book features a wide range of topics in the areas of science, technology, engineering, arts, and math to ensure a blend of both science and humanities research. Therefore, it is ideal for curriculum developers, instructional designers, teachers, school administrators, higher education faculty, professionals, researchers, and students studying across all academic disciplines.

This is the second edition of the first ever book to explore the exciting new field of augmented reality art and its enabling technologies. The new edition has been thoroughly revised and updated, and contains 5 new chapters. As well as investigating augmented reality as a novel artistic medium the book covers cultural, social, spatial and cognitive facets of augmented reality art. Intended as a starting point for exploring this new fascinating area of research and creative practice it will be essential reading not only for artists, researchers and technology developers, but also for students (graduates and undergraduates) and all those interested in emerging augmented reality technology and its current and future applications in art.

Artificial intelligence (AI) is taking an increasingly important role in our society. From cars, smartphones, airplanes, consumer applications, and even medical equipment, the impact of AI is changing the world around us. The ability of machines to demonstrate advanced cognitive skills in taking decisions, learn and perceive the environment, predict certain behavior, and process written or spoken languages, among other skills, makes this discipline of paramount importance in today's world. Although AI is changing the world for the better in many applications, it also comes with its challenges. This book encompasses many applications as well as new techniques, challenges, and opportunities in this fascinating area.

Understanding Augmented Reality addresses the elements that are required to create augmented reality experiences. The technology that supports augmented reality will come and go, evolve and change. The underlying principles for creating exciting, useful augmented reality experiences are timeless. Augmented reality designed from a purely technological perspective will lead to an AR experience that is novel and fun for one-time consumption - but is no more than a toy. Imagine a filmmaking book that discussed cameras and special effects software, but ignored cinematography and storytelling! In order to create compelling augmented reality experiences that stand the test of time and cause the participant in the AR experience to focus on the content of the experience - rather than the technology - one must consider how to maximally exploit the affordances of the medium. Understanding Augmented Reality addresses core conceptual issues regarding the medium of augmented reality as well as the technology required to support compelling augmented reality. By addressing AR as a medium at the conceptual level in addition to the technological level, the reader will learn to conceive of AR applications that are not limited by today’s technology. At the same time, ample examples are provided that show what is possible with current technology. Explore the different techniques, technologies

and approaches used in developing AR applications Learn from the author's deep experience in virtual reality and augmented reality applications to succeed right off the bat, and avoid many of the traps that catch new developers and users of augmented reality experiences Some AR examples can be experienced from within the book using downloadable software

Virtual and augmented reality is the next frontier of technological innovation. As technology exponentially evolves, so do the ways in which humans interact and depend upon it. Virtual and Augmented Reality: Concepts, Methodologies, Tools, and Applications is a comprehensive reference source for the latest scholarly material on the trends, techniques, and uses of virtual and augmented reality in various fields, and examines the benefits and challenges of these developments. Highlighting a range of pertinent topics, such as human-computer interaction, digital self-identity, and virtual reconstruction, this multi-volume book is ideally designed for researchers, academics, professionals, theorists, students, and practitioners interested in emerging technology applications across the digital plane.

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.

With the current advances in technology innovation, the field of medicine and healthcare is rapidly expanding and, as a result, many different areas of human health diagnostics, treatment and care are emerging. Wireless technology is getting faster and 5G mobile technology allows the Internet of Medical Things (IoMT) to greatly improve patient care and more effectively prevent illness from developing. This book provides an overview and review of the current and anticipated changes in medicine and healthcare due to new technologies and faster communication between users and devices. This groundbreaking book presents state-of-the-art chapters on many subjects including: A review of the implications of VR and AR healthcare applications A review of current augmenting dental care An overview of typical human-computer interaction (HCI) that can help inform the development of user interface designs and novel ways to evaluate human behavior to responses in virtual reality (VR) and other new technologies A review of telemedicine technologies Building empathy in young children using augmented reality AI technologies for mobile health of stroke

monitoring & rehabilitation robotics control Mobile doctor brain AI App An artificial intelligence mobile cloud computing tool Development of a robotic teaching aid for disabled children Training system design of lower limb rehabilitation robot based on virtual reality

This is the first comprehensive research monograph devoted to the use of augmented reality in education. It is written by a team of 58 world-leading researchers, practitioners and artists from 15 countries, pioneering in employing augmented reality as a new teaching and learning technology and tool. The authors explore the state of the art in educational augmented reality and its usage in a large variety of particular areas, such as medical education and training, English language education, chemistry learning, environmental and special education, dental training, mining engineering teaching, historical and fine art education. Augmented Reality in Education: A New Technology for Teaching and Learning is essential reading not only for educators of all types and levels, educational researchers and technology developers, but also for students (both graduates and undergraduates) and anyone who is interested in the educational use of emerging augmented reality technology.

The instant New York Times bestseller! A Wall Street Journal Best Science Book of the Year! A Popular Science Best Science Book of the Year! From a top scientist and the creator of the hugely popular web comic Saturday Morning Breakfast Cereal, a hilariously illustrated investigation into future technologies -- from how to fling a ship into deep space on the cheap to 3D organ printing What will the world of tomorrow be like? How does progress happen? And why do we not have a lunar colony already? What is the hold-up? In this smart and funny book, celebrated cartoonist Zach Weinersmith and noted researcher Dr. Kelly Weinersmith give us a snapshot of what's coming next -- from robot swarms to nuclear fusion powered-toasters. By weaving their own research, interviews with the scientists who are making these advances happen, and Zach's trademark comics, the Weinersmiths investigate why these technologies are needed, how they would work, and what is standing in their way. New technologies are almost never the work of isolated geniuses with a neat idea. A given future technology may need any number of intermediate technologies to develop first, and many of these critical advances may appear to be irrelevant when they are first discovered. The journey to progress is full of strange detours and blind alleys that tell us so much about the human mind and the march of civilization. To this end, Soonish investigates ten different emerging fields, from programmable matter to augmented reality, from space elevators to robotic construction, to show us the amazing world we will have, you know, soonish. Soonish is the perfect gift for science lovers for the holidays!

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The 13th International Conference on Human–Computer Interaction, HCI Inter- tional 2009, was held in San Diego, California, USA, July

19–24, 2009, jointly with the Symposium on Human Interface (Japan) 2009, the 8th International Conference on Engineering Psychology and Cognitive Ergonomics, the 5th International Conference on Universal Access in Human–Computer Interaction, the Third International Conf- ence on Virtual and Mixed Reality, the Third International Conference on Internati- alization, Design and Global Development, the Third International Conference on Online Communities and Social Computing, the 5th International Conference on Augmented Cognition, the Second International Conference on Digital Human Mod- ing, and the First International Conference on Human Centered Design. A total of 4,348 individuals from academia, research institutes, industry and gove- mental agencies from 73 countries submitted contributions, and 1,397 papers that were judged to be of high scientific quality were included in the program. These papers - dress the latest research and development efforts and highlight the human aspects of the 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.

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.

Written by a team of world-renowned artists, researchers and practitioners - all pioneers in using augmented reality based creative works and installations as a new form of art - this is the first book to explore the exciting new field of augmented reality art and its enabling technologies. As well as investigating augmented reality as a novel artistic medium the book covers cultural, social, spatial and cognitive facets of augmented reality art. Intended as a starting point for exploring this new fascinating area of research and creative practice it will be essential reading not only for artists, researchers and technology developers, but also for students (graduates and undergraduates) and all those interested in emerging augmented reality technology and its current and future applications in art.

Augmented reality (AR) and virtual reality (VR) provide flexibility in education and have become widely used for the promotion of multimedia learning. This use coincides with mobile devices becoming prevalent, VR devices becoming more affordable, and the creation of user-friendly software that allows the development of AR/VR applications by non-experts. However, because the integration of AR and VR into education is a fairly new practice that is only in its initial stage, these processes and outcomes need to be improved. Designing, Deploying, and Evaluating Virtual and Augmented Reality in Education is an essential research book that presents current practices and procedures from

different technology-implementation stages (design, deployment, and evaluation) to help educators use AR/VR applications in their own teaching practices. The book provides comprehensive information on AR and VR applications in different educational settings from various perspectives including but not limited to mobile learning, formal/informal learning, and integration strategies with practical and/or theoretical implications. Barriers and challenges to their implementation that are currently faced by educators are also addressed. This book is ideal for academicians, instructors, curriculum designers, policymakers, instructional designers, researchers, education professionals, practitioners, and students.

"This book provides a good grounding of the main concepts and terminology for Augmented Reality (AR), with an emphasis on practical AR techniques (from tracking-algorithms to design principles for AR interfaces). The targeted audience is computer-literate readers who wish to gain an initial understanding of this exciting and emerging technology"--Provided by publisher.

Online gaming is widely popular and gaining more user attention every day. Computer game industries have made considerable growth in terms of design and development, but the scarcity of hardware resources at player or client side is a major pitfall for the latest high-end multimedia games. Cloud gaming is one proposed solution, allowing the end-user to play games using a variety of platforms with less demanding hardware requirements. Emerging Technologies and Applications for Cloud-Based Gaming explores the opportunities for the gaming industry through the integration of cloud computing. Focusing on design methodologies, fundamental architectures, and the end-user experience, this publication is an essential reference source for IT specialists, game developers, researchers, and graduate-level students.

Augmented Reality (AR) refers to the merging of a live view of the physical, real world with context-sensitive, computer-generated images to create a mixed reality. Through this augmented vision, a user can digitally interact with and adjust information about their surrounding environment on-the-fly. Handbook of Augmented Reality provides an extensive overview of the current and future trends in Augmented Reality, and chronicles the dramatic growth in this field. The book includes contributions from world expert s in the field of AR from academia, research laboratories and private industry. Case studies and examples throughout the handbook help introduce the basic concepts of AR, as well as outline the Computer Vision and Multimedia techniques most commonly used today. The book is intended for a wide variety of readers including academicians, designers, developers, educators, engineers, practitioners, researchers, and graduate students. This book can also be beneficial for business managers, entrepreneurs, and investors.

Slated as ‘the next big thing in tech’, augmented reality promises to take the screen out of our hands and wrap it around the world via ‘smart spectacles’. As a pervasive, invisible interface between the world and our senses, AR offers unparalleled capacity to reveal hidden digital depths, but it also comes at a cost to our privacy, our property, and our reality. In this crucial and provocative book, Mark Pesce draws on over thirty years’ experience to offer the first mainstream exploration of augmented reality. He discusses the exciting and beneficial features of AR as well as the issues and risks raised by this still-emerging technology – a technology that moulds us by shaping what we see and hear. Augmented Reality is essential reading for anyone interested in the growing influence of this impressive but deeply concerning technology. As the book reveals, reality - once augmented - will never be the same.

This book gathers papers on interactive and collaborative mobile learning environments, assessment, evaluation and research methods in mobile learning, mobile learning models, theory and pedagogy, open and distance mobile learning, life-long and informal learning using mobile devices, wearables and the Internet of Things, game-based learning, dynamic learning experiences, mobile systems and services for opening up education, mobile healthcare and training, case studies on mobile learning, and 5G network infrastructure. Today, interactive

mobile technologies have become the core of many--if not all--fields of society. Not only do the younger generation of students expect a mobile working and learning environment, but also the new ideas, technologies and solutions introduced on a nearly daily basis also boost this trend. Discussing and assessing key trends in the mobile field were the primary aims of the 13th International Conference on Interactive Mobile Communication Technologies and Learning (IMCL2019), which was held in Thessaloniki, Greece, from 31 October to 01 November 2019. Since being founded in 2006, the conference has been devoted to new approaches in interactive mobile technologies, with a focus on learning. The IMCL conferences have since become a central forum of the exchange of new research results and relevant trends, as well as best practices. The books intended readership includes policymakers, academics, educators, researchers in pedagogy and learning theory, schoolteachers, further education lecturers, practitioners in the learning industry, etc.

The Springer Handbook of Augmented Reality presents a comprehensive and authoritative guide to augmented reality (AR) technology, its numerous applications, and its intersection with emerging technologies. This book traces the history of AR from its early development, discussing the fundamentals of AR and its associated science. The handbook begins by presenting the development of AR over the last few years, mentioning the key pioneers and important milestones. It then moves to the fundamentals and principles of AR, such as photogrammetry, motion and objects tracking, and marker-based and markerless registration. The book discusses both software toolkits and techniques and hardware related to AR, before presenting the applications of AR. This includes both end-user applications like education and fashion, and professional applications within engineering fields, medicine and archecture, amongst others. The book concludes with the convergence of AR with other emerging technologies such as Industrial Internet of Things and big data. The handbook presents a comprehensive reference on AR technology from an academic, industrial and commercial perspective, making it an invaluable resource for audiences from a variety of backgrounds.

Technological advances have helped to enhance disaster resilience through better risk reduction, response, mitigation, rehabilitation and reconstruction. In former times, it was local and traditional knowledge that was mainly relied upon for disaster risk reduction. Much of this local knowledge is still valid in today’s world, even though possibly in different forms and contexts, and local knowledge remains a shared part of life within the communities. In contrast, with the advent of science and technology, scientists and engineers have become owners of advanced technologies, which have contributed significantly to reducing disaster risks across the globe. This book analyses emerging technologies and their effects in enhancing disaster resilience. It also evaluates the gaps, challenges, capacities required and the way forward for future disaster management. A wide variety of technologies are addressed, focusing specifically on new technologies such as cyber physical systems, geotechnology, drone, and virtual reality (VR)/ augmented reality (AR). Other sets of emerging advanced technologies including an early warning system and a decision support system are also reported on. Moreover, the book provides a variety of discussions regarding information management, communication, and community resilience at the time of a disaster. This book’s coverage of different aspects of new technologies makes it a valuable resource for students, researchers, academics, policymakers, and development practitioners.

In an environment where some countries are coming out of the recession at different speeds and others remain in a gloomy economic environment, education plays a vital role in reducing the negative impact of the global economic problems. In this sense, new technologies help to generate human resources with a better quality of education. Augmented Reality for Enhanced Learning Environments provides emerging research on using new technologies to encourage education and improve learning quality through augmented reality. While

highlighting issues such as global economic problems impacting schools and insufficient aid, this publication explores new technologies in emerging economies and effective means of knowledge and learning transfer. This book is a vital resource for teachers, students, and aid workers seeking current research on creating a new horizon in science and technology to strengthen the current system of learning.