Practical Augmented Reality A Guide To The Technologies Applications And Human Factors For Ar And Vr Usability

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.

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.

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

This book provides extensive research into the use of augmented reality in the three interconnected and overlapping fields of the tourism industry, museum exhibitions, and cultural heritage. It is written by a virtual team of 50 leading researchers and practitioners from 16 countries around the world. The authors explore the opportunities and challenges of augmented reality applications, their current status and future trends, informal learning and heritage preservation, mixed reality environments and immersive installations, cultural heritage education and tourism promotion, visitors with special needs, and emerging post-COVID-19 museums and heritage sites. Augmented Reality in Tourism, Museums and Heritage: A New Technology to Inform and Entertain is essential reading not only for researchers, application developers, educators, museum curators, tourism and cultural heritage promoters, but also for students (both graduates and undergraduates) and anyone who is interested in the efficient and practical use of augmented reality technology.

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.

Discover THE next big competitive advantage in business: learn how augmented and virtual reality can put your business ahead. Augmented reality (AR) and virtual reality (VR) are part of a new wave of immersive technologies that offer huge opportunities for businesses, across industries and regardless of their size. Most people think of AR or VR as a new development in video gaming like Pokémon GO, or an expensive marketing campaign by the Nikes of the world. The truth is, businesses of any size can put these new technologies to immediate use in areas that include: - Learning and development - Remote collaboration and assistance - Visualization of remote assets and environments - Sales and marketing - Consumer behaviour research Reality Check dispels the common misconceptions of AR and VR, such as them being too expensive or not easily scalable, and details how business leaders can integrate them into their business to deliver more efficient, impactful and cost-effective business solutions. The up and coming voice of AR and VR for

businesses, Jeremy Dalton, uses case studies from organizations all over the world including Cisco, Ford, GlaxoSmithKline, La Liga and Vodafone to showcase the practical uses of immersive technologies. Reality Check makes cutting-edge technology accessible and grounds them into the everyday workings of normal businesses. It is your one-stop non-technical guide to incredibly exciting new technologies that will deliver results.

A step-by-step tutorial-based guide aimed at giving you hands-on practical experience to develop AR applications for Android.Augmented Reality for Android Application Development is for Android mobile application developers who are familiar with Android Development Tools and deployment, JMonkeyEngine, and the Vuforia SDK.

This book has an aim to present latest applications, trends and developments of virtual reality technologies in three humanities disciplines: in medicine, psychology and pedagogy. Studies show that people in both educational as well as in the medical therapeutic range expect more and more that modern media are included in the corresponding demand and supply structures. For the Internet and various mobile media, associated research and application projects now have fixed key words such as "E-learning" and "E-Mental Health" or "M-Learning", "M-Mental Health". This book aims to contribute to the current state of the corresponding efforts in the area of ??further promising technology - the Virtual Reality - designed to give an overview and secondly to provide a stimulus on specific projects, associated with the hope of giving to scientists and practitioners from the humanities an impulse for their own (further-) development, evaluation and implementation of various VR scenarios in the education and health sectors.

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.

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.

Telegeoinformatics is a new discipline resulting from the integration of mobile computing with wired and wireless communications, geoinformatics (including GIS and GPS), and remote sensing techniques and technologies. Users of telegeoinformatics from every field will need a comprehensive reference to solve multiple types of problems involving locat

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.

Considering the overall situation of the current pandemic and pertinent recommendations, this book focuses on the use of augmented reality (AR) applications for preventing COVID-19 outbreaks along with techniques, tools, and platforms to achieve social distancing.and sanitization. COVID-19 Public Health Measures: An Augmented Reality Perspective contains theoretical and practical knowledge of AR and remedies on how to cope with the pandemic, including multiple use cases along with a set of recommendations. This book illustrates application building using open-source software with an interactive interface to aid impaired users. The initial part of this book emphasizes the basic knowledge of AR, technology, devices, and rest of the relevant theories. This book is aimed at researchers, students of AR, technical healthcare professionals, and practitioners. Key Features: • Consists of an extensive introduction to the terminologies and components of AR • Provides in-depth knowledge of various tools and techniques used in AR • Introduces various

platforms and software development kits (SDKs) such as Unity Engine, Unreal Engine, and Vuforia • Gives a step-by-step guide for the development of an AR app • Describes how AR can be used specifically by impaired users not only in the situation of current pandemic but also in normal situations thus simplifying day-to-day activities

New technologies and ongoing developments in the fields of Virtual reality, augmented reality and artificial intelligence are changing the ways in which we facilitate learning. Recognising the positive role these technologies can play in the learning and progress of students assessed as having special educational needs, this practical guide explains the characteristics, benefits, risks and potential applications of new technologies in the classroom. An innovative and timely resource, Virtual Reality, Augmented Reality and Artificial Intelligence in Special Education offers a background in the evidence-based theory and practice of using new technologies in an educational context. Accessible and free of complex jargon, chapters provide information on the development, intended uses and most current terminology used in relation to technologies, and explains how modern equipment, approaches and possibilities can be used to promote improved communication skills, independent learning and heightened self-esteem amongst students diagnosed with SEND. Offering a wealth of practical tips, downloadable resources and ideas for engaging with technology in the classroom, the text will support teachers to ensure that students can benefit from exciting technological advances and learn to use them appropriately. Demystifying a complex and varied field, this practical resource will inspire and inform teachers, SENCOs and practitioners working with children and students with SEND as they harness the use of technology in the classroom.

AR applications allow people to interact with the real world through digitally enhanced content. This AR Unity 3D book helps you demystify AR technology using your existing knowledge of Unity, enables you to build multiple AR projects with real-world utility and a professional workflow, and shows you how to use AR Foundation for building apps.

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

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.

Using Virtual Reality in English Language Arts Education provides researched-based teaching practices and strong theoretical support for teaching English Language Arts with Virtual and Augmented Reality tools. It is perfect for teachers of any experience level, with or without prior experience with VR/AR.

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

Unity is the most exciting and popular game engine. After the latest release, Unity has become the primary source of game and Virtual Reality development throughout the world. In this book, you'll learn how to use Unity by making amazing games from

popular genres; from an action shooter to a mindbending puzzle game, from an adventure to a VR game.

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.

An imaginative, full-color, fully authorized in-world guide to the creatures and scenes from all of the Alien movies, including breathtaking 3-D Augmented Reality animations. A book like no other. An experience you'll never forget. The Alien movie franchise has been shocking audiences for more than thirty-five years, and the series now continues in eons to come—where this special interactive edition derives. Beamed back to us from the future reality witnessed in the movies, it is a handbook for new recruits of the U.S. Colonial Marines. The Book of Alien includes everything you need to know to identify and combat the terrifying, extra-terrestrial species known as Xenomorphs. Protecting yourself and mankind against this significant and ever-growing threat is the goal. With this book, you will learn how to clearly identify the threat—and which weapons you will need to successfully neutralize it. A practical combat guide The Book of Alien is both an old-world handbook—featuring paper pages, text, diagrams, and 100 color and black-and-white photographs—and a futurebook—with 3D interactive animations, sound and vision. A superb interactive companion volume to all the Alien movies, The Book of Alien is an exciting immersive experience that lets you revisit many key moments from the movies, and interact with people, objects . . . and of course, aliens! This groundbreaking book features Augmented Reality animations, which bring favorite Xenomorph creatures to life via smartphone or tablet.

Get close and comfortable with Unity and build applications that run on HoloLens, Daydream, and Oculus Rift Key Features Build fun augmented reality applications using ARKit, ARCore, and Vuforia Explore virtual reality by developing more than 10 engaging projects Learn how to integrate AR and VR concepts together in a single application Book Description Unity is the leading platform to develop mixed reality experiences because it provides a great pipeline for working with 3D assets. Using a practical and project-based approach, this Learning Path educates you about the specifics of AR and VR development using Unity 2018 and Unity 3D. You'll learn to integrate, animate, and overlay 3D objects on your camera feed, before moving on to implement sensor-based AR applications. You'll explore various concepts by creating an AR application using Vuforia for both macOS and Windows for Android and iOS devices. Next, you'll learn how to develop VR applications that can be experienced with devices, such as Oculus and Vive. You'll also explore various tools for VR development: gaze-based versus hand controller input, world space UI canvases, locomotion and teleportation, timeline animation, and multiplayer networking. You'll learn the Unity 3D game engine via the interactive Unity Editor and C# programming. By the end of this Learning Path, you'll be fully equipped to develop rich, interactive mixed reality experiences using Unity. This Learning Path includes content from the following Packt products: Unity Virtual Reality Projects - Second Edition by Jonathan Linowes Unity 2018 Augmented Reality Projects by Jesse Glover What you will learn Create 3D scenes to learn about world space and scale Move around your scenes using locomotion and teleportation Create filters or overlays that work with facial recognition software Interact with virtual objects using eye gaze, hand controllers, and user input events Design and build a VR storytelling animation with a soundtrack and timelines Create social VR experiences with Unity networking Who this book is for If you are a game developer familiar with 3D computer graphics and interested in building your own AR and VR games or applications, then this Learning Path is for you. Any prior experience in Unity and C# will be an advantage. In all, this course teaches you the tools and techniques to develop engaging mixed reality applications.

The new realities are here. Virtual and Augmented realities and 360 video technologies are rapidly entering our homes and office spaces. Good quality audio has always been important to the user experience, but in the new realities, it is more than important, it's essential. If the audio doesn't work, the immersion of the experience fails and the cracks in the new reality start to show. This practical guide helps you navigate the challenges and pitfalls of designing audio for these new realities. This technology is different from anything we've seen before and requires an entirely new approach; this book will introduce the broad concepts you need to know before delving into the practical detail you need.

Augmented reality (AR) is transforming how we work, learn, play and connect with the world, and is now being introduced to the field of medicine, where it is revolutionising healthcare as pioneering virtual elements are being added to real images to provide a more compelling and intuitive view during procedures. This book, which had its beginnings at the AE-CAI: Augmented Environments for Computer-Assisted Interventions MICCAI Workshop in Munich in 2015, is the first to review the area of mixed and augmented reality in medicine. Covering a range of examples of the use of AR in medicine, it explores its relevance to minimally-invasive interventions, how it can improve the accuracy of a procedure and reduce procedure time, and how it may be employed to reduce radiation risks. It also discusses how AR can be an effective tool in the education of physicians, medical students, nurses and other health professionals. Features: An ideal practical

guide for medical professionals and students looking to understand the implementation, applications, and future of AR Contains the latest developments and technologies in this innovative field Edited by highly respected pioneers in the field, who have been immersed in AR as well as virtual reality and image-guided surgery since their inception, with chapter contributions from subject area specialists working with AR

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.

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

Create engaging Augmented Reality (AR) applications with Unity 3D that can be experienced with devices such as HoloLens and Daydream Key Features Learn the principles of AR application development Work with the most popular sensors used in AR games and applications across Android, Apple and Windows Build experiences with interactive objects, physics, UI, animations, and C# scripting Book Description Augmented Reality allows for radical innovations in countless areas. It magically blends the physical and virtual worlds, bringing applications from a screen into your hands. Meanwhile, Unity has now become the leading platform to develop augmented reality experiences, as it provides a great pipeline for working with 3D assets. Using a practical and project-based approach, Unity 2018 Augmented Reality Projects educates you about the specifics of augmented reality development in Unity 2018. This book teaches you how to use Unity in order to develop AR applications which can be experienced with devices such as HoloLens and Daydream. You will learn to integrate, animate, and overlay 3D objects on your camera feed, before gradually moving on to implementing sensor-based AR applications. In addition to this, you will explore the technical considerations that are especially important and possibly unique to AR. The projects in the book demonstrate how you can build a variety of AR experiences, whilst also giving insights into C# programming as well as the Unity 3D game engine via the interactive Unity Editor. By the end of the book, you will be equipped to develop rich, interactive augmented reality experiences for a range of AR devices and platforms using Unity. What you will learn Build and run AR applications for specific headsets, including HoloLens and Daydream Create 3D scenes with Unity and other 3D tools while learning about world space and scale Move around your AR scenes using locomotion and teleportation Create filters or overlays that work in tandem with facial recognition software Use GPS, geolocation services, and the camera feed to create a fitness application Integrate AR and VR concepts together in a single application Who this book is for Unity 2018 Augmented Reality Projects is for you if you're a game developer familiar with 3D computer graphics and interested in building your own AR games or applications. Any experience in Unity and C# is an advantage.

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.

Engaging, interactive learning—right in your students' hands! What if your students' mobile devices became an instructional asset rather than a distraction? Discover how free, scannable technology can enrich learning, while captivating students. Best of all, these technologies are easy to quickly implement within your classroom. Learn about QR codes and Augmented Reality (AR) Reach each student with new, hands-on learning opportunities Embrace the ACES Framework for teaching with scannable technologies: Access, Curate, Engage, and Share Promote self-directed learning and showcase students' creations Leverage technology to connect classroom activities with students' families and the broader community

An introduction to augmented reality describes how the technology works and includes code samples to create an augmented reality system.

This book surveys the many ways of telling stories with digital technology, including blogging, gaming, social media, podcasts, and Web video. * Provides a bibliography listing sources consulted * Contains an index of key words and concepts from the text

Despite popular forays into augmented and virtual reality in recent years, spatial computing still sits on the cusp of mainstream use. Developers, artists, and designers looking to enter this field today have few places to turn for expert

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

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.

Create your own augmented reality games from scratch with Unity 5 About This Book Create your own augmented reality game from scratch and join the virtual reality gaming revolution Use the latest Unity 5 VR SDK to create pro-level AR games like Pokemon Go Innovate and explore the latest and most promising trend of AR gaming in the mobile gaming industry Who This Book Is For This book is for those who have a basic knowledge of game development techniques, but no previous knowledge of Unity is required. Some basic programming knowledge would be desirable, but the book is an introduction to the topic. The book is also suitable for experienced developers new to GIS or GPS development. What You Will Learn Build a location-based augmented reality game called Foodie Go Animate a player's avatar on a map Use the mobile device's camera as a game background Implement database persistence with SQLLite4Unity3D to carry inventory items across game sessions Create basic UI elements for the game, inventory, menu, and settings Perform location and content searches against the Google Places API Enhance the game's mood by adding visual shader effects Extend the game by adding multiplayer networking and other enhancements In Detail The heyday of location-based augmented reality games is upon us. They have been around for a few years, but the release of Pokemon Go was a gamechanger that catalyzed the market and led to a massive surge in demand. Now is the time for novice and experienced developers alike to turn their good ideas into augmented reality (AR) mobile games and meet this demand! If you are keen to develop virtual reality games with the latest Unity 5 toolkit, then this is the book for you. The genre of location-based AR games introduces a new platform and technical challenges, but this book will help simplify those challenges and show how to maximize your game audience. This book will take you on a journey through building a location-based AR game that addresses the core technical concepts: GIS fundamentals, mobile device GPS, mapping, map textures in Unity, mobile device camera, camera textures in Unity, accessing location-based services, and other useful Unity tips. The technical material also discusses what is necessary for further development to create a multiplayer version of the game. At the end, you will be presented with troubleshooting techniques in case you get into trouble and need a little help. Style and approach This book shows you how to create every step of the game and gives practical examples.

Create advanced applications with Python and OpenCV, exploring the potential of facial recognition, machine learning, deep learning, web computing and augmented reality. Key Features Develop your computer vision skills by mastering algorithms in Open Source Computer Vision 4 (OpenCV 4) and Python Apply machine learning and deep learning techniques with TensorFlow and Keras Discover the modern design patterns you should avoid when developing efficient computer vision applications Book Description OpenCV is considered to be one of the best open source computer vision and machine learning software libraries. It helps developers build complete projects in relation to image processing, motion detection, or image segmentation, among many others. OpenCV for Python enables you to run computer vision algorithms smoothly in real time, combining the best of the OpenCV C++ API and the Python language. In this book, you'll get started by setting up OpenCV and delving into the key concepts of computer vision. You'll then proceed to study more advanced concepts and discover the full potential of OpenCV. The book will also introduce you to the creation of advanced applications using Python and OpenCV, enabling you to develop applications that include facial recognition, target tracking, or augmented reality. Next, you'll learn machine learning techniques and concepts, understand how to apply them in real-world examples, and also explore their benefits, including real-time data production and faster data processing. You'll also discover how to translate the functionality provided by OpenCV into optimized application code projects using Python bindings. Toward the concluding chapters, you'll explore the application of artificial intelligence and deep learning techniques using the popular Python libraries TensorFlow, and Keras. By the end of this book, you'll be able to develop advanced computer vision applications to meet your customers' demands. What you will learn Handle files and images, and explore various image processing techniques Explore image transformations, including translation, resizing, and cropping Gain insights into building histograms Brush up on contour detection, filtering, and drawing Work with Augmented Reality to build marker-based and markerless applications Work with the main machine learning algorithms in OpenCV Explore the deep learning Python libraries and OpenCV deep learning capabilities Create computer vision and deep learning web applications Who this book is for This book is designed for computer vision developers, engineers, and researchers who want to develop modern computer vision applications. Basic experience of OpenCV and Python programming is a must.

Practical Augmented RealityA Guide to the Technologies, Applications, and Human Factors for AR and VRAddison-Wesley Professional

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.

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