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KEY=20 - YOSEF WILSON

MECHANISM DESIGN FOR ROBOTICS

MDPI MEDER 2018, the IFToMM International Symposium on Mechanism Design for Robotics, was the fourth event in a series that was started in 2010 as a specific conference activity on mechanisms for robots. The aim of the MEDER Symposium is to bring researchers, industry professionals, and students together from a broad range of disciplines dealing with mechanisms for robots, in an intimate, collegial, and stimulating environment. In the 2018 MEDER event, we received significant attention regarding this initiative, as can be seen by the fact that the Proceedings contain contributions by authors from all around the world. The Proceedings of the MEDER 2018 Symposium have been published within the Springer book series on MMS, and the book contains 52 papers that have been selected after review for oral presentation. These papers cover several aspects of the wide field of robotics dealing with mechanism aspects in theory, design, numerical evaluations, and applications. This Special Issue of Robotics (https://www.mdpi.com/journal/robotics/special_issues/MDR) has been obtained as a result of a second review process and selection, but all the papers that have been accepted for MEDER 2018 are of very good quality with interesting contents that are suitable for journal publication, and the selection process has been difficult.

REAL-TIME RENDERING

A K Peters, Ltd. Thoroughly revised, this third edition focuses on modern techniques used to generate synthetic three-dimensional images in a fraction of a second. With the advent of programmable shaders, a wide variety of new algorithms have arisen and evolved over the past few years. This edition discusses current, practical rendering methods used in games and other applications. It also presents a solid theoretical framework and relevant mathematics for the field of interactive computer graphics, all in an approachable style. The authors have made the figures used in the book available for download for fair use.:Download Figures.

IMAGE AND VIDEO TECHNOLOGY

9TH PACIFIC-RIM SYMPOSIUM, PSIVT 2019, SYDNEY, NSW, AUSTRALIA, NOVEMBER 18–22, 2019, PROCEEDINGS

Springer Nature This book constitutes the conference proceedings of the 9th Pacific Rim Symposium on Image and Video Technology, PSIVT 2019, held in Sydney, NSW, Australia, in November 2019. A total of 31 papers were carefully reviewed and selected from 55 submissions. The main conference comprises 11 major subject areas that span the field of image and video technology, namely imaging and graphics hardware and visualization, image/video coding and transmission, image/video processing and analysis, image/video retrieval and scene understanding, applications of image and video technology, biomedical image processing and analysis, biometrics and image forensics, computational photography and arts, computer and robot vision, pattern recognition, and video surveillance.

COGNITIVE ASPECTS OF HUMAN-COMPUTER INTERACTION FOR GIS

MDPI The book is dealing with recent progress in human–computer interaction (HCI) related to geographic information science (GIS). The Editorial starts with an overview about the evolution of the Internet and first HCI concepts and stimulates recent HCI developments using 3D and 4D apps, running on all mobile devices with OS Android, iOS, Linus, and Windows. Eight research articles present the state-of-the-art in HCI–GIS-related issues, starting with gender and age differences in using indoor maps via the estimation of building heights from space to an efficient visualization method for polygonal data with dynamic simplification. The review article deals with progress and challenges on entity alignment of geographic knowledge bases.

NEW TRENDS IN COMPUTER TECHNOLOGIES AND APPLICATIONS

23RD INTERNATIONAL COMPUTER SYMPOSIUM, ICS 2018, YUNLIN, TAIWAN, DECEMBER 20–22, 2018, REVISED SELECTED PAPERS

Springer The present book includes extended and revised versions of papers presented during the 2018 International Computer Symposium (ICS 2018), held in Yunlin, Republic of China (Taiwan), on December 20-22, 2018. The 86 papers presented were carefully reviewed and selected from 263 submissions from 11 countries. The variety of the topics include machine learning, sensor devices and platforms, sensor networks, robotics, embedded systems, networks, operating systems, software system structures, database design and models, multimedia and multimodal retrieval, object detection, image processing, image compression, mobile and wireless security.

NON-PHOTOREALISTIC RENDERING

CRC Press The ubiquity of computer-generated imagery around us, in movies, advertising or on the Internet is already being taken for granted and what impresses most people is the photorealistic quality of the images. Pictures, as we have often been told, are worth a thousand words and the information transported by an image can take many different forms. Man

3D RECORDING AND INTERPRETATION FOR MARITIME ARCHAEOLOGY

Springer This open access peer-reviewed volume was inspired by the UNESCO UNITWIN Network for Underwater Archaeology International Workshop held at Flinders University, Adelaide, Australia in November 2016. Content is based on, but not limited to, the work presented at the workshop which was dedicated to 3D recording and interpretation for maritime archaeology. The volume consists of contributions from leading international experts as well as up-and-coming early career researchers from around the globe. The content of the book includes recording and analysis of maritime archaeology through emerging technologies, including both practical and theoretical contributions. Topics include photogrammetric recording, laser scanning, marine geophysical 3D survey techniques, virtual reality, 3D modelling and reconstruction, data integration and Geographic Information Systems. The principal incentive for this publication is the ongoing rapid shift in the methodologies of maritime archaeology within recent years and a marked increase in the use of 3D and digital approaches. This convergence of digital technologies such as underwater photography and photogrammetry, 3D sonar, 3D virtual reality, and 3D printing has highlighted a pressing need for these new methodologies to be considered together, both in terms of defining the state-of-the-art and for consideration of future directions. As a scholarly publication, the audience for the book includes

students and researchers, as well as professionals working in various aspects of archaeology, heritage management, education, museums, and public policy. It will be of special interest to those working in the field of coastal cultural resource management and underwater archaeology but will also be of broader interest to anyone interested in archaeology and to those in other disciplines who are now engaging with 3D recording and visualization.

COMPUTER VISION – ECCV 2020

16TH EUROPEAN CONFERENCE, GLASGOW, UK, AUGUST 23–28, 2020, PROCEEDINGS, PART XV

Springer Nature The 30-volume set, comprising the LNCS books 12346 until 12375, constitutes the refereed proceedings of the 16th European Conference on Computer Vision, ECCV 2020, which was planned to be held in Glasgow, UK, during August 23-28, 2020. The conference was held virtually due to the COVID-19 pandemic. The 1360 revised papers presented in these proceedings were carefully reviewed and selected from a total of 5025 submissions. The papers deal with topics such as computer vision; machine learning; deep neural networks; reinforcement learning; object recognition; image classification; image processing; object detection; semantic segmentation; human pose estimation; 3d reconstruction; stereo vision; computational photography; neural networks; image coding; image reconstruction; object recognition; motion estimation.

HIGH PERFORMANCE COMPUTING

ISC HIGH PERFORMANCE 2018 INTERNATIONAL WORKSHOPS, FRANKFURT/MAIN, GERMANY, JUNE 28, 2018, REVISED SELECTED PAPERS

Springer This book constitutes the refereed post-conference proceedings of 13 workshops held at the 33rd International ISC High Performance 2018 Conference, in Frankfurt, Germany, in June 2018: HPC I/O in the Data Center, HPC-IODC 2018; Workshop on Performance and Scalability of Storage Systems, WOPSSS 2018; 13th Workshop on Virtualization in High-Performance Cloud Computing, VHPC 2018; Third International Workshop on In Situ Visualization, WOIV 2018; 4th International Workshop on Communication Architectures for HPC, Big Data, Deep Learning and Clouds at Extreme Scale, ExaComm 2018; International Workshop on OpenPOWER for HPC, IWOPH 2018; IXPUG Workshop: Many-Core Computing on Intel Processors; Workshop on Sustainable Ultrascale Computing Systems; Approximate and Transprecision Computing on Emerging Technologies, ATCET 2018; First Workshop on the Convergence of Large-Scale Simulation and Artificial Intelligence; Third Workshop for Open Source Supercomputing, OpenSuCo 2018; First Workshop on Interactive High-Performance Computing; Workshop on Performance Portable Programming Models for Accelerators, P^3MA 2018. The 53 full papers included in this volume were carefully reviewed and selected from 80 submissions. They cover all aspects of research, development, and application of large-scale, high performance experimental and commercial systems. Topics include HPC computer architecture and hardware; programming models, system software, and applications; solutions for heterogeneity, reliability, power efficiency of systems; virtualization and containerized environments; big data and cloud computing; and artificial intelligence.

COMPUTER VISION – ECCV 2018

15TH EUROPEAN CONFERENCE, MUNICH, GERMANY, SEPTEMBER 8-14, 2018, PROCEEDINGS, PART XVI

Springer The sixteen-volume set comprising the LNCS volumes 11205-11220 constitutes the refereed proceedings of the 15th European Conference on Computer Vision, ECCV 2018, held in Munich, Germany, in September 2018.The 776 revised papers presented were carefully reviewed and selected from 2439 submissions. The papers are organized in topical sections on learning for vision; computational photography; human analysis; human sensing; stereo and reconstruction; optimization; matching and recognition; video attention; and poster sessions.

PHYSICALLY BASED RENDERING

FROM THEORY TO IMPLEMENTATION

Morgan Kaufmann This updated edition describes both the mathematical theory behind a modern photorealistic rendering system as well as its practical implementation. Through the ideas and software in this book, designers will learn to design and employ a full-featured rendering system for creating stunning imagery. Includes a companion site complete with source code for the rendering system described in the book, with support for Windows, OS X, and Linux.

NEXT GENERATION COMPUTER ANIMATION TECHNIQUES

THIRD INTERNATIONAL WORKSHOP, ANINEX 2017, BOURNEMOUTH, UK, JUNE 22-23, 2017, REVISED SELECTED PAPERS

Springer This book constitutes the thoroughly refereed post-conference proceedings of the Third International Workshop on Next Generation Computer Animation Techniques, AniNex 2017, held in Bournemouth, UK, in June 2017. The workshop was held in conjunction with the 11th International Conference on E-Learning and Games, Edutainment 2017. The 17 full papers presented in this volume were carefully reviewed and selected from 27 submissions. The papers are structured according to the four main themes: simulation and rendering for computer animation; character modeling and dynamics; user centered design and modeling; computer animation systems and virtual reality based applications.

PRODUCTION VOLUME RENDERING

DESIGN AND IMPLEMENTATION

CRC Press Due to limited publicly available software and lack of documentation, those involved with production volume rendering often have to start from scratch creating the necessary elements to make their system work. Production Volume Rendering: Design and Implementation provides the first full account of volume rendering techniques used for feature animation and visual effects production. It covers the theoretical underpinnings as well as the implementation of a working renderer. The book offers two paths toward understanding production volume rendering. It describes: Modern production volume rendering techniques in a generic context, explaining how the techniques fit together and how the modules are used to achieve real-world goals Implementation of the techniques, showing how to translate abstract concepts into concrete, working code and how the ideas work together to create a complete system As an introduction to the field and an overview of current techniques and algorithms, this book is a valuable source of information for programmers, technical directors, artists, and anyone else interested in how production volume rendering works. Web Resource The scripts, data, and source code for the book’s renderer are freely available at https://github.com/pvrbook/pvr. Readers can see how the code is implemented and acquire a practical understanding of how various design considerations impact scalability, extensibility, generality, and performance.

RENDERING WITH AUTOCAD USING NXTRENDER

Learn how to use nXtRender to create stunning images from your AutoCAD drawings.Turn your AutoCAD designs into beautifully rendered, high-resolution images.Add lights, materials, skies, etc. to create Photorealistic renderings directly from AutoCADCreate photo-realistic, still, panaroma and animation images files from 3D models using raytracing and radiosity technologies.This reference manual has Tutorials, explanations of rendering terms, and specific instructions for Wizards to help you use nXtRender for AutoCAD.Step-by-step examples will make it easy to learn how to render with AutoCAD.Examples, Images and information on rendering tems and capabilities which you can use to improve your renderings.

PHOTOGRAPHIC RENDERING WITH V-RAY FOR SKETCHUP

Packt Publishing Ltd This book is filled with examples explaining the theoretical concepts behind them. Filled with sample screenshots, diagrams, and final rendered images, this book will help readers develop an understanding of photographic rendering with V-Ray. If you are a SketchUp user who would love to turn your favourite modelling application into a 'virtual photography studio', then this book has been designed and written for you. Existing V-Ray users will also find plenty to enjoy and benefit from in this book. Some basic experience with SketchUp and familiarity with photography will be helpful, but is not mandatory.

REAL-TIME RENDERING, FOURTH EDITION

CRC Press Thoroughly updated, this fourth edition focuses on modern techniques used to generate synthetic three-dimensional images in a fraction of a second. With the advent of programmable shaders, a wide variety of new algorithms have arisen and evolved over the past few years. This edition discusses current, practical rendering methods used in games and o

RAY TRACING GEMS

HIGH-QUALITY AND REAL-TIME RENDERING WITH DXR AND OTHER APIS

Apress This book is a must-have for anyone serious about rendering in real time. With the announcement of new ray tracing APIs and hardware to support them, developers can easily create real-time applications with ray tracing as a core component. As ray tracing on the GPU becomes faster, it will play a more central role in real-time rendering. Ray Tracing Gems provides key building blocks for developers of games, architectural applications, visualizations, and more. Experts in rendering share their knowledge by explaining everything from nitty-gritty techniques that will improve any ray tracer to mastery of the new capabilities of current and future hardware. What you'll learn: The latest ray tracing techniques for developing real-time applications in multiple domains Guidance, advice, and best practices for rendering applications with Microsoft DirectX Raytracing (DXR) How to implement high-performance graphics for interactive visualizations, games, simulations, and more Who this book is for:Developers who are looking to leverage the latest APIs and GPU technology for real-time rendering and ray tracing Students looking to learn about best practices in these areas Enthusiasts who want to understand and experiment with their new GPUs

CORONA RENDERER. THE COMPLETE GUIDE

ARCHITECTURAL DESIGN WITH SKETCHUP

3D MODELING, EXTENSIONS, BIM, RENDERING, MAKING, AND SCRIPTING

John Wiley & Sons Go beyond the basics: making SketchUp work for you Architectural Design with SketchUp, Second Edition, is the leading guide to this incredibly useful tool for architects, interior designers, construction professionals, and makers. With easy to follow tutorials that first brush up on the basics of the program and then cover many advanced processes, this resource offers both informative text and full-color illustrations to clearly convey the techniques and features you need to excel. The updated second edition has a new chapter that explains how to make things with SketchUp, and covers 3D printing, design to fabrication, CNC milling, and laser cutting. Other chapters also now cover Building Information Modeling (BIM) and 3D web content generation. Additionally, the revised text offers insight into the latest products and plugin extensions, navigation methods, import/export options, and 3D model creation features to ensure you have an up to date understanding of how to make SketchUp help you meet your project goals. A leading 3D modeling application, SketchUp features documentation capabilities through photorealistic renderings and construction drawings. Because of its ease of use and ability to be enhanced with many plugin extensions for project-specific applications, SketchUp is considered the tool of choice for professionals in the architecture, interior design, construction, and fabrication fields. Access thoroughly updated information in an easy to understand writing style Increase your efficiency and accuracy when using SketchUp and refresh and supplement your understanding of SketchUp's basics Explore component-based modeling for assembly, scheduling, collaborative design, and modeling with a BIM approach Find the right plugin extensions and understand how to best work with them See how easy it is to generate presentation-ready renderings from your 3D models Learn how you can use 3D printing, CNC milling, and laser cutting to make things with SketchUp Use cookbook-style Ruby coding to create amazing 3D objects Supplement your knowledge with video tutorials, sample files, and Ruby scripts via a robust companion website Architectural Design with SketchUp, Second Edition, is an integral resource for both students and professionals working in the architecture, interior design, construction, and fabrication industries.

DAY AND NIGHT

Chronicle Books Day, a cheerful fellow, is suspicious of Night, who has darker moods, but the two become friends after they are able to look at each other's unique qualities from a different perspective.

BIM HANDBOOK

A GUIDE TO BUILDING INFORMATION MODELING FOR OWNERS, DESIGNERS, ENGINEERS, CONTRACTORS, AND FACILITY MANAGERS

John Wiley & Sons Discover BIM: A better way to build better buildings Building Information Modeling (BIM) offers a novel approach to design, construction, and facility management in which a digital representation of the building product and process is used to facilitate the exchange and interoperability of information in digital format. BIM is beginning to change the way buildings look, the way they function, and the ways in which they are designed and built. The BIM Handbook, Third Edition provides an in-depth understanding of BIM technologies, the business and organizational issues associated with its implementation, and the profound advantages that effective use of BIM can provide to all members of a project team. Updates to this edition include: Information on the ways in which professionals should use BIM to gain maximum value New topics such as collaborative working, national and major construction clients, BIM standards and guides A discussion on how various professional roles have expanded through the widespread use and the new avenues of BIM practices and services A wealth of new case studies that clearly illustrate exactly how BIM is applied in a wide variety of conditions Painting a colorful and thorough picture of the state of the art in building information modeling, the BIM Handbook, Third Edition guides readers to successful implementations, helping them to avoid needless frustration and costs and take full advantage of this paradigm-shifting approach to construct better buildings that consume fewer materials and require less time, labor, and capital resources.

DIALOGUE WITH HANS KUNG

SCM Press The lectures collected in this volume shed some fascinating light on Hans Kung's career and present a moving picture of one of the greatest theologians of our time.

LINE DRAWINGS FROM 3D MODELS

A TUTORIAL

Drawing is the starting point for many kinds of tasks, for everyone from children making pictures to professional architects sketching ideas. Drawing seems to be fundamentally connected to how we represent the world visually. Most computer graphics focuses on realistic visual simulation, but over the past few decades, line drawing algorithms have matured, providing the ability to automatically create reasonable line drawings from 3D geometry. This tutorial provides a detailed guide to the mathematical theory and computer algorithms for line drawing of 3D objects. It focuses on the curves known as contours as they are the most important curves for line drawing of 3D surfaces. The authors describe the different algorithms required to compute and render these curves, before going on to explain boundary curves and surface-surface intersection curves. The tutorial concludes with other topics in 3D non-photorealistic rendering including: other types of curves, stroke rendering, and non-photorealistic shading. Line Drawings from 3D Models: A Tutorial is a concise, yet comprehensive, introduction to an increasingly important topic in computer graphics. The extensive bibliography is invaluable for readers wishing to further their own research in the area.

AUGMENTED REALITY

PRINCIPLES AND PRACTICE

Addison-Wesley Professional 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.

THE ART OF 3D DRAWING

AN ILLUSTRATED AND PHOTOGRAPHIC GUIDE TO CREATING ART WITH THREE-DIMENSIONAL REALISM

Walter Foster Artists won't believe their eyes as they learn to draw with photorealistic detail. The Art of 3D Drawing shows artists how to transform simple pencil sketches into jaw-dropping, photorealistic masterpieces. Through a variety of step-by-step exercises and demonstrations, pencil artists learn to take their drawing skills to a whole new level, beginning with a review of the basics, including perspective, shading, rendering textures, and building dimension. Practice lessons then demonstrate how to draw a range of subjects in realistic detail, from food and candy wrappers to animals and portraits. Finally, aspiring artists learn to use color media, including pencils and airbrushing, to add even greater dimension and realism to their artwork to complete their three-dimensional masterpieces.

RENDERING IN SKETCHUP

FROM MODELING TO PRESENTATION FOR ARCHITECTURE, LANDSCAPE ARCHITECTURE, AND INTERIOR DESIGN

John Wiley & Sons The sure way for design professionals to learn SketchUp modeling and rendering techniques Rendering In SketchUp provides instructions for creating 3D photoreal graphics for SketchUp models using integrated rendering programs. The book serves as a beginner rendering manual and reference guide to further develop rendering skills. With an emphasis on step-by-step process, SketchUp users learn a universal approach to rendering varied SketchUp projects, including architecture, interiors, and site design models. The book focuses on tasks and principles at the core of photorealistic rendering, including: Rendering process: Learn a step-by-step process focused on workflow within SketchUp’s familiar workspace. Universal method: Understand how the process can be used to work with a variety of different integrated rendering programs, including Shaderlight, SU Podium and Twilight Render**. These programs are easy to learn and function in SketchUp. > Textures and materials: Discover how to obtain, apply and edit texture images representing surfaces. Component details: Learn how to acquire and organize model details to allow for rich, expressive settings while maintaining computer and SketchUp performance. Exterior and simulated lighting: Learn to set exterior lighting with the SketchUp’s Shadow menu or illuminate a scene with simulated lights, lamps, and bulbs. Render settings: Use specific settings for various rendering programs to quickly set texture character, image quality, and graphic output. Computer specifications: Find out how computers produce renders and the type of computer hardware required to streamline the process. Photoshop post-processing: Learn how to further refine rendered images in Photoshop. **Free online chapters: The book reviews specific settings for SketchUp and the rendering plug-in Shaderlight. Given the ever-changing nature of technology, free, online accompanying chapters detail settings for additional integrated rendering programs including SU Podium, Twilight Render, and more.

3D DELINEATION

A MODERNISATION OF DRAWING METHODOLOGY FOR FIELD ARCHAEOLOGY

Archaeopress Access Archaeology How can 3D models be integrated more fully alongside other forms of archaeological documentation? This work presents a method that combines the interpretative power of traditional archaeological drawings and the realistic visualisation capacity of 3D digital models.

DRAWING FUTURES

SPECULATIONS IN CONTEMPORARY DRAWING FOR ART AND ARCHITECTURE

UCL Press Drawing Futures brings together international designers and artists for speculations in contemporary drawing for art and architecture.Despite numerous developments in technological manufacture and computational design that provide new grounds for designers, the act of drawing still plays a central role as a vehicle for speculation. There is a rich and long history of drawing tied to innovations in technology as well as to revolutions in our philosophical understanding of the world. In reflection of a society now underpinned by computational networks and interfaces allowing hitherto unprecedented views of the world, the changing status of the drawing and its representation as a political act demands a platform for reflection and innovation. Drawing Futures will present a compendium of projects, writings and interviews that critically reassess the act of drawing and where its future may lie.Drawing Futures focuses on the discussion of how the field of drawing may expand synchronously alongside technological and computational developments. The book coincides with an international conference of the same name, taking place at The Bartlett School of Architecture, UCL, in November 2016. Bringing together practitioners from many creative fields, the book discusses how drawing is changing in relation to new technologies for the production and dissemination of ideas.

DIGITAL MODELING OF MATERIAL APPEARANCE

Elsevier Computer graphics systems are capable of generating stunningly realistic images of objects that have never physically existed. In order for computers to create these accurately detailed images, digital models of appearance must include robust data to give viewers a credible visual impression of the depicted materials. In particular, digital models demonstrating the nuances of how materials interact with light are essential to this capability. Digital Modeling of Material Appearance is the first comprehensive work on the digital modeling of material appearance: it explains how models from physics and engineering are combined with keen observation skills for use in computer graphics rendering. Written by the foremost experts in appearance modeling and rendering, this book is for practitioners who want a general framework for understanding material modeling tools, and also for researchers pursuing the development of new modeling techniques. The text is not a "how to" guide for a particular software system. Instead, it provides a thorough discussion of foundations and detailed coverage of key advances. Practitioners and researchers in applications such as architecture, theater, product development, cultural heritage documentation, visual simulation and training, as well as traditional digital application areas such as feature film, television, and computer games, will benefit from this much needed resource. ABOUT THE AUTHORS Julie Dorsey and Holly Rushmeier are professors in the Computer Science Department at Yale University and co-directors of the Yale Computer Graphics Group. François Sillion is a senior researcher with INRIA (Institut National de Recherche en Informatique et Automatique), and director of its Grenoble Rhône-Alpes research center. First comprehensive treatment of the digital modeling of material appearance Provides a foundation for modeling appearance, based on the physics of how light interacts with materials, how people perceive appearance, and the implications of rendering appearance on a digital computer An invaluable, one-stop resource for practitioners and researchers in a variety of fields dealing with the digital modeling of material appearance

SKETCH-BASED INTERFACES AND MODELING

Springer Science & Business Media The field of sketch-based interfaces and modeling (SBIM) is concerned with developing methods and techniques to enable users to interact with a computer through sketching - a simple, yet highly expressive medium. SBIM blends concepts from computer graphics, human-computer interaction, artificial intelligence, and machine learning. Recent improvements in hardware, coupled with new machine learning techniques for more accurate recognition, and more robust depth inferencing techniques for sketch-based modeling, have resulted in an explosion of both sketch-based interfaces and pen-based computing devices. Presenting the first coherent, unified overview of SBIM, this unique text/reference bridges the two complementary research areas of user interaction (sketch-based interfaces), and graphical modeling and construction (sketch-based modeling). The book discusses the state of the art of this rapidly evolving field, with contributions from an international selection of experts. Also covered are sketch-based systems that allow the user to manipulate and edit existing data - from text, images, 3D shapes, and video - as opposed to modeling from scratch. Topics and features: reviews pen/stylus interfaces to graphical applications that avoid reliance on user interface modes; describes systems for diagrammatic sketch recognition, mathematical sketching, and sketch-based retrieval of vector drawings; examines pen-based user interfaces for engineering and educational applications; presents a set of techniques for sketch recognition that rely strictly on spatial information; introduces the Teddy system; a pioneering sketching interface for designing free-form 3D models; investigates a range of advanced sketch-based systems for modeling and designing 3D objects, including complex contours, clothing, and hair-styles; explores methods for modeling from just a single sketch or using only a few strokes. This text is an essential resource for researchers, practitioners and graduate students involved in human-factors and user interfaces, interactive computer graphics, and intelligent user interfaces and AI.

IMAGE-BASED RENDERING

Springer Science & Business Media Focusing exclusively on Image-Based Rendering (IBR) this book examines the theory, practice, and applications associated with image-based rendering and modeling. Topics covered vary from IBR basic concepts and representations on the theory side to signal processing and data compression on the practical side. One of the only titles devoted exclusively to IBR this book is intended for researchers, professionals, and general readers interested in the topics of computer graphics, computer vision, image process, and video processing. With this book advanced-level students in EECS studying related disciplines will be able to seriously expand their knowledge about image-based rendering.

RADIOSITY AND REALISTIC IMAGE SYNTHESIS

Elsevier The goal of image synthesis is to create, using the computer, a visual experience that is identical to what a viewer would experience when viewing a real environment. Radiosity and Realistic Image Synthesis offers the first comprehensive look at the radiosity method for image synthesis and the tools required to approach this elusive goal. Basic concepts and mathematical fundamentals underlying image synthesis and radiosity algorithms are covered thoroughly. (A basic knowledge of undergraduate calculus is assumed). The algorithms that have been developed to implement the radiosity method ranging from environment subdivision to final display are discussed. Successes and difficulties in implementing and using these algorithms are highlighted. Extensions to the basic radiosity method to include glossy surfaces, fog or smoke, and realistic light sources are also described. There are 16 pages of full colour images and over 100 illustrations to explain the development and show the results of the radiosity method. Results of applications of this new technology from a variety of fields are also included. Michael Cohen has worked in the area of realistic image synthesis since 1983 and was instrumental in the development of the radiosity method. He is currently an assistant professor of computer science at Princeton University. John Wallace is a software engineer at 3D/EYE, Inc., where he is the project leader for the development of Hewlett-Packard's ATRCore radiosity and ray tracing library. A chapter on the basic concepts of image synthesis is contributed by Patrick Hanrahan. He has worked on the topic of image synthesis at Pixar, where he was instrumental in the development of the Renderman software. He has also led research on the hierarchical methods at Princeton University, where he is an associate professor of computer science. All three authors have written numerous articles on radiosity that have appeared in the SIGGAPH proceedings and elsewhere. They have also taught the SIGGRAPH course on radiosity for 5 years. * The first comprehensive book written about radiosity - Features applications from the fields of computer graphics, architecture, industrial design, and related computer aided design technologies - Offers over 100 illustrations and 16 pages of full-color images demonstrating the results of radiosity methods - Contains a chapter authored by Pat Hanrahan on the basic concepts of image synthesis and a foreword by Donald Greenberg

REAL-TIME SHADOWS

CRC Press Important elements of games, movies, and other computer-generated content, shadows are crucial for enhancing realism and providing important visual cues. In recent years, there have been notable improvements in visual quality and speed, making high-quality realistic real-time shadows a reachable goal. Real-Time Shadows is a comprehensive guide to the theory and practice of real-time shadow techniques. It covers a large variety of different effects, including hard, soft, volumetric, and semi-transparent shadows. The book explains the basics as well as many advanced aspects related to the domain of shadow computation. It presents interactive solutions and practical details on shadow computation. The authors compare various algorithms for creating real-time shadows and illustrate how they are used in different situations. They explore the limitations and failure cases, advantages and disadvantages, and suitability of the algorithms in several applications. Source code, videos, tutorials, and more are available on the book’s website www.realtimeshadows.com.

SKETCHUP FOR SITE DESIGN

A GUIDE TO MODELING SITE PLANS, TERRAIN, AND ARCHITECTURE

John Wiley & Sons The site designer's guide to SketchUp's powerful modeling capabilities SketchUp for Site Design is the definitive guide to SketchUp for landscape architects and other site design professionals. Step-by-step tutorials walk you through basic to advanced processes, with expert guidance toward best practices, customization, organization, and presentation. This new second edition has been revised to align with the latest software updates, with detailed instruction on using the newest terrain modeling tools and the newly available extensions and plug-ins. All graphics have been updated to reflect the current SketchUp interface and menus, and the third part of the book includes all-new content featuring the use of new grade and terrain extensions. Developed around the needs of intermediate professional users and their workflows, this book provides practical all-around coaching on using SketchUp specifically for modeling site plans. SketchUp was designed for usability, with the needs of the architect, industrial designer, and engineers at center stage. This book shows you how the software's powerful terrain and grade functions make it an ideal tool for site designers, and how to seamlessly integrate it into your workflow for more efficient design and comprehensive planning. Master the SketchUp basics, navigation, components, and scripts Turn 2D sketches into 3D models with volume, color, and material Create detailed site plans, custom furnishings, gradings, and architecture Learn sandbox tools, organization strategies, and model presentation tips SketchUp has undergone major changes since the publication of this guide's first edition, with its sale to Trimble Navigation bringing about a number of revisions and the availability of more immediately useful features. SketchUp for Site Design shows you how to harness the power of this newly expanded feature set to smooth and optimize the site design workflow.

HOLOGRAPHIC MATERIALS AND OPTICAL SYSTEMS

BoD – Books on Demand Holographic Materials and Optical Systems covers recent research achievements in the areas of volume holographic optical elements and systems, development of functionalized holographic recording materials, and applications in holographic imaging and metrology. Designs of single and multiplexed volume holographic optical elements for laser beam shaping, combining, and redirection are covered, and their properties are studied theoretically and experimentally. The high impact of holography in imaging and metrology is demonstrated by applications spreading from thickness and surface measurements, through antenna metrology and analyzing high-density gradients in fluid mechanics to characterization of live objects in clinical diagnostics. Novel functionalized materials used in dynamic or permanent holographic recording cover photopolymers, photochromics, photo-thermo-refractive glasses, and hybrid organic-inorganic media.

CREATING GAMES

MECHANICS, CONTENT, AND TECHNOLOGY

CRC Press Creating Games offers a comprehensive overview of the technology, content, and mechanics of game design. It emphasizes the broad view of a games team and teaches you enough about your teammates' areas so that you can work effectively with them. The authors have included many worksheets and exercises to help get your small indie team off the ground. Special features: Exercises at the end of each chapter combine comprehension tests with problems that help the reader interact with the material Worksheet exercises provide creative activities to help project teams generate new ideas and then structure them in a modified version of the format of a game industry design document Pointers to the best resources for digging deeper into each specialized area of game development Website with worksheets, figures from the book, and teacher materials including study guides, lecture presentations, syllabi, supplemental exercises, and assessment materials

THE SKETCHUP WORKFLOW FOR ARCHITECTURE

MODELING BUILDINGS, VISUALIZING DESIGN, AND CREATING CONSTRUCTION DOCUMENTS WITH SKETCHUP PRO AND LAYOUT

John Wiley & Sons A guide for leveraging SketchUp for any project size, type, or style. New construction or renovation. The revised and updated second edition of The SketchUp Workflow for Architecture offers guidelines for taking SketchUp to the next level in order to incorporate it into every phase of the architectural design process. The text walks through each step of the SketchUp process from the early stages of schematic design and model organization for both renovation and new construction projects to final documentation and shows how to maximize the LayOut toolset for drafting and presentations. Written by a noted expert in the field, the text is filled with tips and techniques to access the power of SketchUp and its related suite of tools. The book presents a flexible workflow method that helps to make common design tasks easier and gives users the information needed to incorporate varying degrees of SketchUp into their design process. Filled with best practices for organizing projects and drafting schematics, this resource also includes suggestions for working with LayOut, an underused but valuable component of SketchUp Pro. In addition, tutorial videos compliment the text and clearly demonstrate more advanced methods. This important text: Presents intermediate and advanced techniques for architects who want to use SketchUp in all stages of the design process Includes in-depth explanations on using the LayOut tool set that contains example plans, details, sections, presentations, and other information Updates the first edition to reflect the changes to SketchUp 2018 and the core functionalities, menus, tools, inferences, arc tools, reporting, and much more Written by a SketchUp authorized trainer who has an active online platform and extensive connections within the SketchUp community Contains accompanying tutorial videos that demonstrate some of the more advanced SketchUp tips and tricks Written for professional architects, as well as professionals in interior design and landscape architecture, The SketchUp Workflow for Architecture

offers a revised and updated resource for using SketchUp in all aspects of the architectural design process.

A STOCHASTIC GRAMMAR OF IMAGES

Now Publishers Inc A stochastic Grammar of Image is the first book to provide a foundational review and perspective of grammatical approaches to computer vision in its quest for a stochastic and context sensitive grammar of images, if is intended to serve as a unified frame work of representation leaming and recognition for a large number of object categories. It starts out by addressing he historic trends in the area and overviewing the main concepts such as the and or graph the parse graphs the dictionary and goes on to learning issues, semantic gaps between symbols and pixels dataset for for learning and algorithms. The proposal grammar presented integrates three prominent representations in the literature stochastic grammar for composition. Markev (or graphical) models for contexts, and sparse coding with primitives (wavelets). It also combines the structure-based and appearance based methods in the vision literature. At the end of the review three case studies are presented to illustrate the proposed grammar. A Stochastic Grammar of Images is an important contribution to the literature on structured statistical models in computer vision.

GRAPHICS GEMS II

Elsevier Graphics Gems II is a collection of articles shared by a diverse group of people that reflect ideas and approaches in graphics programming which can benefit other computer graphics programmers. This volume presents techniques for doing well-known graphics operations faster or easier. The book contains chapters devoted to topics on two-dimensional and three-dimensional geometry and algorithms, image processing, frame buffer techniques, and ray tracing techniques. The radiosity approach, matrix techniques, and numerical and programming techniques are likewise discussed. Graphics artists and computer programmers will find the book invaluable.

REALISTIC RAY TRACING, SECOND EDITION

A K Peters, Ltd. Concentrating on the "nuts and bolts" of writing ray tracing programs, this new and revised edition emphasizes practical and implementation issues and takes the reader through all the details needed to write a modern rendering system. Most importantly, the book adds many C++ code segments, and adds new details to provide the reader with a better intuitive understanding of ray tracing algorithms.