Jpeg2000 Image Compression Fundamentals Standards And Practice

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Soft Computing for Problem Solving - Jagdish Chand Bansal 2018-10-30
This two-volume book presents outcomes of the 7th International Conference on Soft Computing for Problem Solving, SocProS 2017. This conference is a joint technical collaboration between the Soft Computing Research Society, Liverpool Hope University (UK), the Indian Institute of Technology Roorkee, the South Asian University New Delhi and the National Institute of Technology Silchar, and brings together researchers, engineers and practitioners to discuss thought-provoking developments and challenges in order to select potential future directions The book presents the latest advances and innovations in the interdisciplinary areas of soft computing, including original research papers in the areas including, but not limited to, algorithms (artificial immune systems, artificial neural networks, genetic algorithms, genetic programming, and particle swarm optimization) and applications (control systems, data mining and clustering, finance, weather forecasting, game theory, business and forecasting applications). It is a valuable resource for both young and experienced researchers dealing with complex and intricate real-world problems for which finding a solution by traditional methods is a difficult task.
Computer Vision – ECCV 2022 - Shai Avidan 2022-10-21
The 39-volume set, comprising the LNCS books 13661 until 13699, constitutes the refereed proceedings of the 17th European Conference on Computer Vision, ECCV 2022, held in Tel Aviv, Israel, during October 23–27, 2022. The 1645 papers presented in these proceedings were carefully reviewed and selected from a total of 5804 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.
Handbook of Research on Mobile Multimedia, Second Edition - Khalil, Ismail 2008-09-30
"The book is intended to clarify the hype, which surrounds the concept of mobile multimedia through introducing the idea in a clear and understandable way, with a strong focus on mobile solutions and applications"--Provided by publisher.
Digital Signal Compression - William A. Pearlman 2011-10-27
Provides clear and easily understandable coverage of the fundamental concepts and coding methods, whilst retaining technical depth and rigor.
The JPEG 2000 Suite - Peter Schelkens 2009-09-03
The JPEG 2000 Suite provides a comprehensive overview of the baseline JPEG 2000 standard and its extensions. The first part of the book sets out the core coding system, additions to the standard and reference software. The second part discusses the successful deployment of JPEG 2000 in application domains such as video surveillance, digital cinema, digital television, medical imaging, defence imaging, security, geographic imaging and remote sensing, digital culture imaging and 3D graphics. The book also presents implementation strategies accompanied by existing software and hardware solutions. Describes secure JPEG 2000 (JPSEC), interactivity protocols (JPIP), volumetric image data compression (JP3D) and image compression in wireless environments (JPWL), amongst others. Uses a structure which allows for easy cross-reference with the components of the standard. Sets out practical implementation examples and results. Examines strategies for future image compression techniques, including Advanced Image Coding and JPEG XR. Includes contributions from international specialists in industry and academia who have worked on the development of the JPEG 2000 standard. Additional material can be found at www.jpeg.org. The JPEG 2000 Suite is an excellent introduction to the JPEG 2000 standard and is of great appeal to practising electronics engineers, researchers, and hardware and software developers using and developing image coding techniques. Graduate students taking courses on image compression, digital archiving, and data storage techniques will also find the book useful, as will graphic designers, artists, and decision makers in industries developing digital applications.
Mixed Raster Content - George Pavlidis 2016-11-01
This book presents the main concepts in handling digital images of mixed content, traditionally referenced as mixed raster content (MRC), in two main parts. The first includes introductory chapters covering the scientific and technical background aspects, whereas the second presents a set of research and development approaches to tackle key issues in MRC segmentation, compression and transmission. The book starts with a review of color theory and the mechanism of color vision in humans. In turn, the second chapter reviews data coding and compression methods so as to set the background and demonstrate the complexity involved in dealing with MRC. Chapter three addresses the segmentation of images through an extensive literature review, which highlights the various approaches used to tackle MRC segmentation. The second part of the book focuses on the segmentation of color images for optimized compression, including multi-layered decomposition and representation of MRC and the processes that can be employed to optimize the coding rates of those different layers. Rounding out the coverage, the final chapter examines the segmentation of color images for optimized transmission.
JPEG2000 Image Compression Fundamentals, Standards and Practice - David Taubman 2012-12-06
This is nothing less than a totally essential reference for engineers and researchers in any field of work that involves the use of compressed imagery. Beginning with a thorough and up-to-date overview of the fundamentals of image compression, the authors move on to provide a complete description of the JPEG2000 standard. They then devote space to the implementation and exploitation of that standard. The final section describes other key image compression systems. This work has specific applications for those involved in the development of software and hardware solutions for multimedia, internet, and medical imaging applications.
Biomedical Information Technology - David Dagan Feng 2011-07-28
The enormous growth in the field of biotechnology necessitates the utilization of information technology for the management, flow and organization of data. The field continues to evolve with the development of new applications to fit the needs of the biomedicine. From molecular imaging to healthcare knowledge management, the storage, access and analysis of data contributes significantly to biomedical research and practice. All biomedical professionals can benefit from a greater understanding of how data can be efficiently managed and utilized through data compression, modelling, processing, registration, visualization, communication, and large-scale biological computing. In addition Biomedical Information Technology contains practical integrated clinical applications for disease detection, diagnosis, surgery, therapy, and biomedical knowledge discovery, including the latest advances in the field, such as ubiquitous M-Health systems and molecular imaging applications. The world's most recognized authorities give their "best practices" ready for implementation Provides professionals with the most up to date and mission critical tools to evaluate the latest advances in the field and current integrated clinical applications Gives new staff the technological fundamentals and updates experienced professionals with the latest practical integrated clinical applications
Frontiers in PDE-Constrained Optimization - Harbir Antil 2018-10-12
This volume provides a broad and uniform introduction of PDE-

constrained optimization as well as to document a number of interesting and challenging applications. Many science and engineering applications necessitate the solution of optimization problems constrained by physical laws that are described by systems of partial differential equations (PDEs). As a result, PDE-constrained optimization problems arise in a variety of disciplines including geophysics, earth and climate science, material science, chemical and mechanical engineering, medical imaging and physics. This volume is divided into two parts. The first part provides a comprehensive treatment of PDE-constrained optimization including discussions of problems constrained by PDEs with uncertain inputs and problems constrained by variational inequalities. Special emphasis is placed on algorithm development and numerical computation. In addition, a comprehensive treatment of inverse problems arising in the oil and gas industry is provided. The second part of this volume focuses on the application of PDE-constrained optimization, including problems in optimal control, optimal design, and inverse problems, among other topics.

Variational, Geometric, and Level Set Methods in Computer Vision - Nikos Paragios 2005-10-04

This book constitutes the refereed proceedings of the Third International Workshop on Variational, Geometric and Level Set Methods in Computer Vision, VLSM 2005, held in Beijing, China in October 2005 within the scope of ICCV 2005, the International Conference on Computer Vision. The 30 revised full papers presented were carefully reviewed and selected for inclusion in the book. The papers are organized in topical sections and sub-sections as follows: image filtering and reconstruction - image enhancement, inpainting and compression; segmentation and grouping - model-free and model-based segmentation; registration and motion analysis - registration of curves and images, multi-frame segmentation; 3D and reconstruction - computational processes in manifolds, shape from shading, calibration and stereo reconstruction.

Proceedings of the 2nd National Conference on Emerging Trends in Information Technology (eIT-2007) - Amol C. Goje 2013-12-30

Information Technology skill standards provide a common language for industry and education. It provides increased portability depending on attitude and performance of the professionals. The industry recognizes IT education programs that build competency among the students to perform the best in the new emerging trends in Information Technology. like Human Computer Interactions, Biometrics, Bioinformatics, Signal Processing. So this conference is organized to bring together leading academicians, industry experts and researchers in the area of emerging trends in Information Technology and facilitate personal interaction and discussions on various aspects of Information Technology. It also aims to provide a platform for the post-graduate students and research students to express their views about the emerging trends in Information Technology with interaction and exchange of ideas among the researchers and students from allover India. With this focus Technical/research papers are invitedfrom the students of MCA/ M.Sc (CS) / M.Sc.(IT)/ MCM and research students on the following topics. Biometrics Data Communication and Security Digital Image and Image Processing Human Computer Interaction Internet Technologies and Service Oriented Architecture Artificial Intelligence and Its Applications

High Performance Images - Colin Bendell 2016-11-03

High-quality images have an amazing power of attraction. Just add some stunning photos and graphics to your website or app and watch your user engagement and conversion numbers climb. It can be tricky, but with this practical guide, you'll master the many facets of delivering high performance images on the internet—without adversely affecting site performance. You'll learn the nuts and bolts of color theory, image formats, storage and management, operations delivery, browser and application behavior, the responsive web, and many other topics. Ideal for developers, this book also provides useful tips, tricks, and practical theory for processing and displaying powerful images that won't slow down your online product. Explore digital image theory and the different formats available Dive into JPEGs, SVG and vector images, lossless compression, and other formats Use techniques for downloading and rendering images in a browser, and for loading images on mobile devices and cellular networks Examine specific rendering techniques, such as lazy loading, image processing, image consolidation, and responsive images Take responsive images to the next level by using content negotiation between browser and server with the Client Hints HTTP standard Learn how to operationalize your image workflow Contributors include Colin Bendell, Tim Kadlec, Yoav Weiss, Guy Podjarny, Nick Doyle, and Mike McCall from Akamai Technologies.

AI Approaches to the Complexity of Legal Systems - Pompeu Casanovas 2010-10-19

Annotation This volume assembles 15 refereed and revised papers, selected from two workshops organized at the XXIV World Congress of Philosophy of Law and Social Philosophy and at JURIX-09. The papers are organized in sections on language and complex systems in law, ontologies and the representation of legal knowledge, argumentation and logics.

A Study of Fire Image Compression Using the Implicit ROI Method of JPEG2000 - Jian Zheng 2007

Environmental, Health and Humanity Issues in the Down Danubian Region - Dragutin Mihailovic 2009

In order to preserve this world for future generations, we must strive for sustainable development OCo a development that meets the needs of the present generation without compromising options and resources for future generations to meet their own needs. However, some scientists suspect that recent large floods, heat waves and drought in Central Europe and the Down Danubian region are indicators of more severe hazardous events in the future. Increased pollution in the atmosphere is causing gradual increase of the temperature. The environment is becoming increasingly endangered, especially as humans encroach on and modify fragile environments. Based on papers presented at the 9th International Symposium on Interdisciplinary Regional Research (ISIRR 2007) ON 21OCo22 June 2007 in Novi Sad (Serbia), this book covers, for the first time, the complex field of technological, agricultural and developmental horizons in natural resources, medical problems, ecological modeling, and relations of humanity issues and society in the Down Danubian region."

Versatile Video Coding - Humberto Ochoa Dominguez 2022-09-01

Video is the main driver of bandwidth use, accounting for over 80 per cent of consumer Internet traffic. Video compression is a critical component of many of the available multimedia applications, it is necessary for storage or transmission of digital video over today's band-limited networks. The majority of this video is coded using international standards developed in collaboration with ITU-T Study Group and MPEG. The MPEG family of video coding standards begun on the early 1990s with MPEG-1, developed for video and audio storage on CD-ROMs, with support for progressive video. MPEG-2 was standardized in 1995 for applications of video on DVD, standard and high definition television, with support for interlaced and progressive video. MPEG-4 part 2, also known as MPEG-2 video, was standardized in 1999 for applications of low- bit rate multimedia on mobile platforms and the Internet, with the support of object-based or content based coding by modeling the scene as background and foreground. Since MPEG-1, the main video coding standards were based on the so-called macroblocks. However, research groups continued the work beyond the traditional video coding architectures and found that macroblocks could limit the performance of the compression when using high-resolution video. Therefore, in 2013 the high efficiency video coding (HEVC) also known and H.265, was released, with a structure similar to H.264/AVC but using coding units with more flexible partitions than the traditional macroblocks. HEVC has greater flexibility in prediction modes and transform block sizes, also it has a more sophisticated interpolation and de blocking filters. In 2006 the VC-1 was released. VC-1 is a video codec implemented by Microsoft and the Microsoft Windows Media Video (VMW) 9 and standardized by the Society of Motion Picture and Television Engineers (SMPTE). In 2017 the Joint Video Experts Team (JVET) released a call for proposals for a new video coding standard initially called Beyond the HEVC, Future Video Coding (FVC) or known as Versatile Video Coding (VVC). VVC is being built on top of HEVC for application on Standard Dynamic Range (SDR), High Dynamic Range (HDR) and 360° Video. The VVC is planned to be finalized by 2020. This book presents the new VVC, and updates on the HEVC. The book discusses the advances in lossless coding and covers the topic of screen content coding. Technical topics discussed include: Beyond the High Efficiency Video CodingHigh Efficiency Video Coding encoderScreen contentLossless and visually lossless coding algorithmsFast coding algorithmsVisual quality assessmentOther screen content coding algorithmsOverview of JPEG Series

Intelligent Sustainable Systems - Atulya K. Nagar 2021-12-16

This book provides insights of World Conference on Smart Trends in Systems, Security and Sustainability (WS4 2021) which is divided into different sections such as Smart IT Infrastructure for Sustainable Society; Smart Management prospective for Sustainable Society; Smart Secure Systems for Next Generation Technologies; Smart Trends for Computational Graphics and Image Modeling; and Smart Trends for

Biomedical and Health Informatics. The proceedings is presented in two volumes. The book is helpful for active researchers and practitioners in the field.

Computational Intelligence for Remote Sensing - Manuel Grana 2008-06-05

to address issues of o- ership authentication in digital contents.

JPEG - William B. Pennebaker 1992-12-31

Created by the Joint Photographic Experts Group (JPEG), the JPEG standard is the first color still image data compression international standard. This new guide to JPEG and its technologies offers detailed information on the new JPEG signaling conventions and the structure of JPEG compressed data.

Knowledge-Based Intelligent Information and Engineering Systems - Bruno Apolloni 2007-09-12

This book is part of a three-volume set that constitutes the refereed proceedings of the 11th International Conference on Knowledge-Based Intelligent Information and Engineering Systems, KES 2007. Coverage in this first volume includes artificial neural networks and connectionists systems, fuzzy and neuro-fuzzy systems, evolutionary computation, machine learning and classical AI, agent systems, and information engineering and applications in ubiquitous computing environments.

Handbook of Image and Video Processing - Alan C. Bovik 2010-07-21

55% new material in the latest edition of this “must-have for students and practitioners of image & video processing! This Handbook is intended to serve as the basic reference point on image and video processing, in the field, in the research laboratory, and in the classroom. Each chapter has been written by carefully selected, distinguished experts specializing in that topic and carefully reviewed by the Editor, Al Bovik, ensuring that the greatest depth of understanding be communicated to the reader. Coverage includes introductory, intermediate and advanced topics and as such, this book serves equally well as classroom textbook as reference resource. • Provides practicing engineers and students with a highly accessible resource for learning and using image/video processing theory and algorithms • Includes a new chapter on image processing education, which should prove invaluable for those developing or modifying their curricula • Covers the various image and video processing standards that exist and are emerging, driving today’s explosive industry • Offers an understanding of what images are, how they are modeled, and gives an introduction to how they are perceived • Introduces the necessary, practical background to allow engineering students to acquire and process their own digital image or video data • Culminates with a diverse set of applications chapters, covered in sufficient depth to serve as extensible models to the reader’s own potential applications About the Editor... Al Bovik is the Cullen Trust for Higher Education Endowed Professor at The University of Texas at Austin, where he is the Director of the Laboratory for Image and Video Engineering (LIVE). He has published over 400 technical articles in the general area of image and video processing and holds two U.S. patents. Dr. Bovik was Distinguished Lecturer of the IEEE Signal Processing Society (2000), received the IEEE Signal Processing Society Meritorious Service Award (1998), the IEEE Third Millennium Medal (2000), and twice was a two-time Honorable Mention winner of the international Pattern Recognition Society Award. He is a Fellow of the IEEE, was Editor-in-Chief, of the IEEE Transactions on Image Processing (1996-2002), has served on and continues to serve on many other professional boards and panels, and was the Founding General Chairman of the IEEE International Conference on Image Processing which was held in Austin, Texas in 1994. * No other resource for image and video processing contains the same breadth of up-to-date coverage * Each chapter written by one or several of the top experts working in that area * Includes all essential mathematics, techniques, and algorithms for every type of image and video processing used by electrical engineers, computer scientists, internet developers, bioengineers, and scientists in various, image-intensive disciplines

Image and Video Compression for Multimedia Engineering - Yun-Qing Shi 2017-12-19

Multimedia hardware still cannot accommodate the demand for large amounts of visual data. Without the generation of high-quality video bitstreams, limited hardware capabilities will continue to stifle the advancement of multimedia technologies. Thorough grounding in coding is needed so that applications such as MPEG-4 and JPEG 2000 may come to fruition. Image and Video Compression for Multimedia Engineering provides a solid, comprehensive understanding of the fundamentals and algorithms that lead to the creation of new methods for generating high quality video bit streams. The authors present a number of relevant advances along with international standards. New to the Second Edition · A chapter describing the recently developed video coding standard, MPEG-Part 10 Advances Video Coding also known as H.264 · Fundamental concepts and algorithms of JPEG2000 · Color systems of digital video · Up-to-date video coding standards and profiles Visual data, image, and video coding will continue to enable the creation of advanced hardware, suitable to the demands of new applications. Covering both image and video compression, this book yields a unique, self-contained reference for practitioners tobuild a basis for future study, research, and development.

Computer Imaging - Scott E Umbaugh 2005-01-27

Computer Imaging: Digital Image Analysis and Processing brings together analysis and processing in a unified framework, providing a valuable foundation for understanding both computer vision and image processing applications. Taking an engineering approach, the text integrates theory with a conceptual and application-oriented style, allowing you to immediately understand how each topic fits into the overall structure of practical application development. Divided into five major parts, the book begins by introducing the concepts and definitions necessary to understand computer imaging. The second part describes image analysis and provides the tools, concepts, and models required to analyze digital images and develop computer vision applications. Part III discusses application areas for the processing of images, emphasizing human visual perception. Part IV delivers the information required to apply a CVIPtools environment to algorithm development. The text concludes with appendices that provide supplemental imaging information and assist with the programming exercises found in each chapter. The author presents topics as needed for understanding each practical imaging model being studied. This motivates the reader to master the topics and also makes the book useful as a reference. The CVIPtools software integrated throughout the book, now in a new Windows version, provides practical examples and encourages you to conduct additional exploration via tutorials and programming exercises provided with each chapter.

JPEG2000 Standard for Image Compression - Tinku Acharya 2005-01-21

JPEG2000 Standard for Image Compression presents readers with the basic background to this multimedia compression technique and prepares the reader for a detailed understanding of the JPEG2000 standard, using both the underlying theory and the principles behind the algorithms of the JPEG2000 standard for scalable image compression. It introduces the VLSI architectures and algorithms for implementation of the JPEG2000 standard in hardware (not available in the current literature), an important technology for a number of image processing applications and devices such as digital camera, color fax, printer, and scanners.

Encyclopedia of Multimedia - Borko Furht 2008-11-26

This second edition provides easy access to important concepts, issues and technology trends in the field of multimedia technologies, systems, techniques, and applications. Over 1,100 heavily-illustrated pages — including 80 new entries — present concise overviews of all aspects of software, systems, web tools and hardware that enable video, audio and developing media to be shared and delivered electronically.

Bio-inspired Computing – Theories and Applications - Maoguo Gong 2017-01-07

The two-volume set, CCIS 681 and CCIS 682, constitutes the proceedings of the 11th International Conference on Bio-Inspired Computing: Theories and Applications, BIC-TA 2016, held in Xi'an, China, in October 2016.The 115 revised full papers presented were carefully reviewed and selected from 343 submissions. The papers of Part I are organized in topical sections on DNA Computing; Membrane Computing; Neural Computing; Machine Learning. The papers of Part II are organized in topical sections on Evolutionary Computing; Multi-objective Optimization; Pattern Recognition; Others.

The Journal of Imaging Science and Technology - 2005

Encyclopedia of Optical and Photonic Engineering (Print) - Five Volume Set - Craig Hoffman 2015-09-22

The first edition of the Encyclopedia of Optical and Photonic Engineering provided a valuable reference concerning devices or systems that generate, transmit, measure, or detect light, and to a lesser degree, the basic interaction of light and matter. This Second Edition not only reflects the changes in optical and photonic engineering that have occurred since the first edition was published, but also: Boasts a wealth of new material, expanding the encyclopedia’s length by 25 percent Contains extensive updates, with significant revisions made throughout

the text Features contributions from engineers and scientists leading the fields of optics and photonics today With the addition of a second editor, the Encyclopedia of Optical and Photonic Engineering, Second Edition offers a balanced and up-to-date look at the fundamentals of a diverse portfolio of technologies and discoveries in areas ranging from x-ray optics to photon entanglement and beyond. This edition's release corresponds nicely with the United Nations General Assembly's declaration of 2015 as the International Year of Light, working in tandem to raise awareness about light's important role in the modern world. Also Available Online This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options Contact Taylor and Francis for more information or to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367; (E-mail) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062; (E-mail) online.sales@tandf.co.uk

Multimedia Transcoding in Mobile and Wireless Networks - Ahmad, Ashraf M.A. 2008-07-31

"This book is designed to provide readers with relevant theoretical frameworks and latest technical and institutional solutions for transcoding multimedia in mobile and wireless networks"--Provided by publisher.

Introduction to Digital Image Processing - William K. Pratt 2013-09-13

The subject of digital image processing has migrated from a graduate to a junior or senior level course as students become more proficient in mathematical background earlier in their college education. With that in mind, Introduction to Digital Image Processing is simpler in terms of mathematical derivations and eliminates derivations of advanced s

Mobile Multimedia Communications: Concepts, Applications, and Challenges - Karmakar, Gour 2007-11-30

With rapid growth of the Internet, the applications of multimedia are burgeoning in every aspect of human life including communication networks and wireless and mobile communications. Mobile Multimedia Communications: Concepts, Applications and Challenges captures defining research on all aspects and implications of the accelerated progress of mobile multimedia technologies. Covered topics include fundamental network infrastructures, modern communication features such as wireless and mobile multimedia protocols, personal communication systems, mobility and resource management, and security and privacy issues. A complete reference to topics driving current and potential future development of mobile technologies, this essential addition to library collections will meet the needs of researchers in a variety of related fields.

M-Health - Robert Istepanian 2007-01-04

M-health can be defined as the 'emerging mobile communications and network technologies for healthcare systems.' This book paves the path toward understanding the future of m-health technologies and services and also introducing the impact of mobility on existing e-health and commercial telemedical systems. M-Health: Emerging Mobile Health Systems presents a new and forward-looking source of information that explores the present and future trends in the applications of current and emerging wireless communication and network technologies for different healthcare scenaria. It also provides a discovery path on the synergies between the 2.5G and 3G systems and other relevant computing and information technologies and how they prescribe the way for the next generation of m-health services. The book contains 47 chapters, arranged in five thematic sections: Introduction to Mobile M-health Systems, Smart Mobile Applications for Health Professionals, Signal, Image, and Video Compression for M-health Applications, Emergency Health Care Systems and Services, Echography Systems and Services, and Remote and Home Monitoring. This book is intended for all those working in the field of information technologies in biomedicine, as well as for people working in future applications of wireless communications and wireless telemedical systems. It provides different levels of material to researchers, computing engineers, and medical practitioners interested in emerging e-health systems. This book will be a useful reference for all the readers in this important and growing field of research, and will contribute to the roadmap of future m-health systems and improve the development of effective healthcare delivery systems.

Mathematics of Data/image Coding, Compression, and Encryption - 2005

Multiresolution Signal and Geometry Processing: Filter Banks, Wavelets, and Subdivision (Version: 2013-09-26) - Michael D. Adams 2013-09-26

This book is intended for use in the teaching of graduate and senior undergraduate courses on multiresolution signal and geometry processing in the engineering and related disciplines. It has been used for several years for teaching purposes in the Department of Electrical and Computer Engineering at the University of Victoria and has been well received by students. This book provides a comprehensive introduction to multiresolution signal and geometry processing, with a focus on both theory and applications. The book has two main components, corresponding to multiresolution processing in the contexts of: 1) signal processing and 2) geometry processing. The signal-processing component of the book studies one-dimensional and multi-dimensional multirate systems, considering multirate structures such as sampling-rate converters, filter banks, and transmultiplexers. A particularly strong emphasis is placed on filter banks. Univariate and multivariate wavelet systems are examined, with the biorthogonal and orthonormal cases both being considered. The relationship between filter banks and wavelet systems is established. Several applications of filter banks and wavelets in signal processing are covered, including signal coding, image compression, and noise reduction. For readers interested in image compression, a detailed overview of the JPEG-2000 standard is also provided. Some other applications of multirate systems are considered, such as transmultiplexers for communication systems (e.g., multicarrier modulation). The geometry-processing component of the book studies subdivision surfaces and subdivision wavelets. Some mathematical background relating to geometry processing is provided, including topics such as homogeneous coordinate transformations, manifolds, surface representations, and polygon meshes. Several subdivision schemes are examined in detail, including the Loop, Kobbelt sqrt(3), and Catmull-Clark methods. The application of subdivision surfaces in computer graphics is considered. A detailed introduction to functional analysis is provided, for those who would like a deeper understanding of the mathematics underlying wavelets and filter banks. For those who are interested in software applications of the material covered in the book, appendices are included that introduce the CGAL and OpenGL libraries. Also, an appendix on the SPL library (which was developed for use with this book) is included. Throughout the book, many worked-through examples are provided. Problem sets are also provided for each major topic covered.

JPEG2000 Image Compression Fundamentals, Standards and Practice - David Taubman 2013-06-29

This is nothing less than a totally essential reference for engineers and researchers in any field of work that involves the use of compressed imagery. Beginning with a thorough and up-to-date overview of the fundamentals of image compression, the authors move on to provide a complete description of the JPEG2000 standard. They then devote space to the implementation and exploitation of that standard. The final section describes other key image compression systems. This work has specific applications for those involved in the development of software and hardware solutions for multimedia, internet, and medical imaging applications.

Visual Communications and Image Processing 2003 - 2003

Computer Security in the 21st Century - D.T. Lee 2005-03-29

Computer Security in the 21st Century shares some of the emerging important research trends reflected in recent advances in computer security, including: security protocol design, secure peer-to-peer and ad hoc networks, multimedia security, and intrusion detection, defense and measurement. Highlights include presentations of : - Fundamental new security - Cryptographic protocols and design, - A new way of measuring network vulnerability: attack surfaces, - Network vulnerability and building impenetrable systems, - Multimedia content protection including a new standard for photographic images, JPEG2000. Researchers and computer security developers will find in this book interesting and useful insights into building computer systems that protect against computer worms, computer viruses, and other related concerns.

Applied Signal Processing - Thierry Dutoit 2010-06-10

Applied Signal Processing: A MATLAB-Based Proof of Concept benefits readers by including the teaching background of experts in various applied signal processing fields and presenting them in a project-oriented framework. Unlike many other MATLAB-based textbooks which only use MATLAB to illustrate theoretical aspects, this book provides fully commented MATLAB code for working proofs-of-concept. The MATLAB code provided on the accompanying online files is the very

heart of the material. In addition each chapter offers a functional introduction to the theory required to understand the code as well as a formatted presentation of the contents and outputs of the MATLAB code. Each chapter exposes how digital signal processing is applied for solving a real engineering problem used in a consumer product. The chapters are organized with a description of the problem in its applicative context and a functional review of the theory related to its solution appearing first. Equations are only used for a precise description of the problem and its final solutions. Then a step-by-step MATLAB-based proof of concept, with full code, graphs, and comments follows. The solutions are simple enough for readers with general signal processing background to understand and they use state-of-the-art signal processing principles. Applied Signal Processing: A MATLAB-Based Proof of Concept is an ideal companion for most signal processing course books. It can be used for preparing student labs and projects.

Streamlining Digital Signal Processing - Richard G. Lyons 2012-05-29

This book presents recent advances in DSP to simplify, or increase the computational speed of, common signal processing operations. The topics describe clever DSP tricks of the trade not covered in conventional DSP textbooks. This material is practical, real-world, DSP tips and tricks as opposed to the traditional highly-specialized, math-intensive, research subjects directed at industry researchers and university professors. This book goes well beyond the standard DSP fundamentals textbook and presents new, but tried-and-true, clever implementations of digital filter design, spectrum analysis, signal generation, high-speed function approximation, and various other DSP functions.

Intelligent Image and Video Compression - Fan Zhang 2021-04-07

Intelligent Image and Video Compression: Communicating Pictures, Second Edition explains the requirements, analysis, design and application of a modern video coding system. It draws on the authors' extensive academic and professional experience in this field to deliver a text that is algorithmically rigorous yet accessible, relevant to modern standards and practical. It builds on a thorough grounding in mathematical foundations and visual perception to demonstrate how modern image and video compression methods can be designed to meet the rate-quality performance levels demanded by today's applications and users, in the context of prevailing network constraints. "David Bull and Fan Zhang have written a timely and accessible book on the topic of image and video compression. Compression of visual signals is one of the great technological achievements of modern times, and has made possible the great successes of streaming and social media and digital cinema. Their book, Intelligent Image and Video Compression covers all the salient topics ranging over visual perception, information theory, bandpass transform theory, motion estimation and prediction, lossy and lossless compression, and of course the compression standards from MPEG (ranging from H.261 through the most modern H.266, or VVC) and the open standards VP9 and AV-1. The book is replete with clear explanations and figures, including color where appropriate, making it quite accessible and valuable to the advanced student as well as the expert practitioner. The book offers an excellent glossary and as a bonus, a set of tutorial problems. Highly recommended! --Al Bovik An approach that combines algorithmic rigor with practical implementation using numerous worked examples Explains how video compression methods exploit statistical redundancies, natural correlations, and knowledge of human perception to improve performance Uses contemporary video coding standards (AVC, HEVC and VVC) as a vehicle for explaining block-based compression Provides broad coverage of important topics such as visual quality assessment and video streaming