Murat Tekalp Digital Video Processing Solution

July 15 – August 12, Bogazici University Campus eNTERFACE'07 took place in Istanbul, at the campus of the Bogazici University. The one month long workshop was attended by 140 people. The workshop was organized around 12 well-defined projects, as the...

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

This book constitutes the refereeed proceedings of the Third European Conference on Multimedia Applications, Services and Techniques, ECMAST '98, held in Berlin, Germany, in May 1998. The 40 revised full papers presented were carefully selected for inclusion in the book by the program committee. The topics covered include multimedia networks and protocols; coded representation of images, sound, and data; multimedia delivery on broadcast and telecom networks; servers and storage architechtures; advanced multimedia terminals and in house networks; multimedia services; Internet and multimedia scenario; and multimedia trials.

Although the computer's life has been relatively short, it has brought about an information revolution that is transforming our world on a scale that is still difficult to comprehend. This digital convergence is shaping society, technology and the media for the next millennium. Areas as diverse as home banking and shopping over the Internet; WWW access over mobile phone networks; and television systems such as Web TV which combine on-line services with television. But convergence is not just about technology. It is also about services and new ways of doing business and of interacting with society. Digital convergence heralds the 'Information Revolution'. Edited by John Vince and Rae Earnshaw this important new book on Digital Convergence: The Information Revolution is an edited volume of papers, bringing together state-of-the-art developments in the Internet and World Wide Web and should be compulsory reading for all those interested in and working in those areas.

With the expectation of greatly enhanced user experience, 3D video is widely perceived as the next major advancement in video technology. In order to fulfil the expectation of enhanced user experience, 3D video calls for new technologies addressing efficient content creation, representation/coding, transmission and display. Emerging Technologies for 3D Video will deal with all aspects involved in 3D video systems and services, including content acquisition and creation, data representation and coding, transmission, view synthesis, rendering, display technologies, human perception of depth and quality assessment. Key features: Offers an overview of key existing technologies for 3D video Provides a discussion of advanced research topics and future technologies Reviews relevant standardization efforts Addresses applications and implementation issues Includes contributions from leading researchers The book is a comprehensive guide to 3D video systems and services suitable for all those involved in this field, including engineers, practitioners, researchers as well as professors, graduate and undergraduate students, and managers making technological decisions about 3D video.

This fully revised and expanded edition gives readers the necessary understanding of image and video processing concepts to contribute to this hot technology's future advances. Important new topics include introductory random processes, image enhancement and analysis, and the new MPEG scalable video coding standard.

Monitoring of public and private sites is increasingly becoming a very important and critical issue, especially after the recent flurry of terrorist attacks including the one on the Word Trade Center in September 2001. It is, therefore, imperative that effective multisensor surveillance systems be developed to protect the society from similar attacks in the future. The new generation of surveillance systems to be developed have a specific requirement: they must be able to automatically identify criminal and terrorist activity without sacrificing individual privacy to the extent possible. Privacy laws concerning monitoring and surveillance systems vary from country to country but, in general, they try to protect the privacy of their citizens. Monitoring and visual surveillance has numerous other applications. It can be employed to help invalids or handicapped and to monitor the activities of elderly people. It can be used to monitor large events such as sporting events, as well. Nowadays, monitoring is employ~d in several different contexts including transport applications, such as monitoring of railway stations and airports, dangerous environments like nuclear facilities or traffic flows on roads and bridges. The latest generation of surveillance systems mainly rely on hybrid analog-digital, or completely digital video communications and processing methods and take advantage of the greater of flexibility offered by video processing algorithms that are capable focusing a human operator's attention on a set of interesting situations.

Technology has spurred the growth of huge image and video libraries, many growing into the hundreds of terabytes. As a result there is a great demand among organizations for the design of databases that can effectively support the storage, search, retrieval, and transmission of video data. Engineers and researchers in the field demand a comprehensi

This book covers the different aspects of modern 3D multimedia technologies by addressing several elements of 3D visual communications systems, using diverse content formats, such as stereo video, video-plus-depth and multiview, and coding schemes for delivery over networks. It also presents the latest advances and research results in regards to objective and subjective quality evaluation of 3D visual content, extending the human factors affecting the perception of quality to emotional states. The contributors describe technological developments in 3D visual communications, with particular emphasis on state-of-the-art advances in acquisition of 3D visual scenes and emerging 3D visual representation formats, such as: multi-view plus depth and light field; evolution to freeview and light-field representation; compression methods and robust delivery systems; and coding and delivery over various channels. Simulation tools,

testbeds and datasets that are useful for advanced research and experimental studies in the field of 3D multimedia delivery services and applications are covered. The international group of contributors also explore the research problems and challenges in the field of immersive visual communications, in order to identify research directions with substantial economic and social impact. 3D Visual Content Creation, Coding and Delivery provides valuable information to engineers and computer scientists developing novel products and services with emerging 3D multimedia technologies, by discussing the advantages and current limitations that need to be addressed in order to develop their products further. It will also be of interest to students and researchers in the field of multimedia services and applications, who are particularly interested in advances bringing significant potential impact on future technological developments.

A complete introduction to the basic and intermediate concepts of image processing from the leading people in the field Up-to-date content, including statistical modeling of natural, anistropic diffusion, image quality and the latest developments in JPEG 2000 This comprehensive and state-of-the art approach to image processing gives engineers and students a thorough introduction, and includes full coverage of key applications: image watermarking, fingerprint recognition, face recognition and iris recognition and medical imaging. "This book combines basic image processing techniques with some of the most advanced procedures. Introductory chapters dedicated to general principles are presented alongside detailed application-orientated ones. As a result it is suitably adapted for different classes of readers, ranging from Master to PhD students and beyond." – Prof. Jean-Philippe Thiran, EPFL, Lausanne, Switzerland "Al Bovik's compendium proceeds systematically from fundamentals to today's research frontiers. Professor Bovik, himself a highly respected leader in the field, has invited an all-star team of contributors. Students, researchers, and practitioners of image processing alike should benefit from the Essential Guide." – Prof. Bernd Girod, Stanford University, USA "This book is informative, easy to read with plenty of examples, and allows great flexibility in tailoring a course on image processing or analysis." – Prof. Pamela Cosman, University of California, San Diego, USA A complete and modern introduction to the basic and intermediate concepts of image processing – edited and written by the leading people in the field An essential reference for all types of engineers working on image processing applications Up-to-date content, including statistical modelling of natural, anisotropic diffusion, image quality and the latest developments in JPEG 2000

In response to the boom in video processing, and multimedia systems and services, this book provides a comprehensive overview of video image processing. Covers the fundamentals of image and video compression and the emerging world standards for various video and image communication applications, including high-definition TV, multimedia workstations, videoconferencing, videophone, and mobile image communications. For electrical engineers, telecommunications managers, computer scientists, product planners, technical and market consultants, and all those interested in digital video image processing.

This book constitutes refereed proceedings of the COST 2102 International Training School on Cognitive Behavioural Systems held in Dresden, Germany, in February 2011. The 39 revised full papers presented were carefully reviewed and selected from various submissions. The volume presents new and original research results in the field of human-machine interaction inspired by cognitive behavioural human-human interaction features. The themes covered are on cognitive and computational social information processing, emotional and social believable Human-Computer Interaction (HCI) systems, behavioural and contextual analysis of interaction, embodiment, perception, linguistics, semantics and sentiment analysis in dialogues and interactions, algorithmic and computational issues for the automatic recognition and synthesis of emotional states.

DSP for In-Vehicle and Mobile Systems is focused on digital signal processing strategies for improving information access, command and control, and communications for in-vehicle environments. It is expected that the next generation of human-to-vehicle interfaces will incorporate speech, video/image, and wireless communication modalities to provide more comfortable and safer driving ambiance. It is also expected that vehicles will become "smarter" and provide a level of wireless information sharing of resources regarding road, weather, traffic, and other information that drivers may need immediately or request at a later time while driving on the road. The format of this work centers on three themes: in-vehicle corpora, speech recognition/dialog systems with emphasis on car environments, and digital signal processing for mobile platforms involving noise suppression, image/video processing, and alternative communication scenarios that can be employed for in-vehicle applications. DSP for In-Vehicle and Mobile Systems is appropriate for researchers and professionals working in signal processing technologies, next generation vehicle design and networked-communications.

In order for wireless devices to function, the signals must be coded in standard ways so that the sender and the receiver can communicate. This area of video source coding is one of the key challenges in the worldwide push to deliver full video communications over wireless devices. Video Coding for Mobile Communications reviews current progress in this field and looks at how to solve some of the most important technology issues in the months and years ahead. The vision of being able to communicate from anywhere, at any time, and with any type of information is on its way to becoming reality. This natural convergence of mobile communications and multimedia is a field that is expected to achieve unprecedented growth and commercial success. Current wireless communication devices support a number of basic multimedia services (voice, messages, basic internet access), but have coding problems that need to be solved before "real-time" mobile video communication can be achieved. Addresses the emerging field of mobile multimedia communications

The advances in computer entertainment, multi-player and online games, technology-enabled art, culture and performance have created a new form of entertainment and art. The success of this new field has influenced the development of the digital entertainment industry and related products/services, which has impacted every aspect of our lives. Handbook of Multimedia for Digital Entertainment and Arts is an edited volume contributed by worldwide experts in

the field of the new digital and interactive media, and their applications in entertainment and arts. This handbook covers leading edge media technologies, and the latest research applied to digital entertainment and arts. The main focus of Handbook of Multimedia for Digital Entertainment and Arts targets interactive and online games, edutainment, e-performance, personal broadcasting, innovative technologies for digital arts, digital visual and auditory media, augmented reality, moving media, and other advanced topics. The final chapters of this book present future trends and developments within this explosive field. Handbook of Multimedia for Digital Entertainment and Arts serves as a primary reference for advanced-level students, researchers and professors studying computer science and electrical engineering. With the dramatic growth of interactive digital entertainment and art applications, this handbook is also suitable as a reference for practitioners, programmers, and engineers working in this field.

A best-seller in its print version, this comprehensive CD-ROM reference contains unique, fully searchable coverage of all major topics in digital signal processing (DSP), establishing an invaluable, time-saving resource for the engineering community. Its unique and broad scope includes contributions from all DSP specialties, including: telecommunications, computer engineering, acoustics, seismic data analysis, DSP software and hardware, image and video processing, remote sensing, multimedia applications, medical technology, radar and sonar applications

Intelligent Systems involve a large class of systems which posses human-like capabilities such as learning, observation, perception, interpretation, reasoning under uncertainty, planning in known and unknown environments, decision making, and control action. The field of intelligent systems is actually a new interdisciplinary field which is the outcome of the interaction, cooperation and synergetic merging of classical fields such as system theory, control theory, artificial intelligence, information theory, operational research, soft computing, communications, linguistic theory, and others. Integrated intelligent decision and control systems involve three primary hierarchical levels, namely organization, coordination and execution levels. As we proceed from the be performed organization to the execution level, the precision about the jobs to increases and accordingly the intelligence required for these jobs decreases. This is in compliance with the principle of increasing precision with decreasing intelligence (IPOI) known from the management field and theoretically established by Saridis using information theory concepts. This book is concerned with intelligent systems and techniques and gives emphasis on the computational and processing issues. Control issues are not included here. The contributions of the book are presented in four parts as follows.

"This book introduces the readers to the various aspects of visual speech recognitions, including lip segmentation from video sequence, lip feature extraction and modeling, feature fusion and classifier design for visual speech recognition and speaker verification" résumé de l'éditeur.

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.

Multimodal Interfaces represents an emerging interdisciplinary research direction and has become one of the frontiers in Computer Science. Multimodal interfaces aim at efficient, convenient and natural interaction and communication between computers (in their broadest sense) and human users. They will ultimately enable users to interact with computers using their everyday skills. These proceedings include the papers accepted for presentation at the Third International Conference on Multimodal Interfaces (ICMI 2000) held in Beijing, China on 1416 October 2000. The papers were selected from 172 contributions submitted worldwide. Each paper was allocated for review to three members of the Program Committee, which consisted of more than 40 leading researchers in the field. Final decisions of 38 oral papers and 48 poster papers were made based on the reviewers' comments and the desire for a balance of topics. The decision to have a single track conference led to a competitive selection process and it is very likely that some good submissions are not included in this volume. The papers collected here cover a wide range of topics such as affective and perceptual computing, interfaces for wearable and mobile computing, gestures and sign languages, face and facial expression analysis, multilingual interfaces, virtual and augmented reality, speech and handwriting, multimodal integration and application systems. They represent some of the latest progress in multimodal interfaces research.

Now available in a three-volume set, this updated and expanded edition of the bestselling The Digital Signal Processing Handbook continues to provide the engineering community with authoritative coverage of the fundamental and specialized aspects of information-bearing signals in digital form. Encompassing essential background material, technical details, standards, and software, the second edition reflects cutting-edge information on signal processing algorithms and protocols related to speech, audio, multimedia, and video processing technology associated with standards ranging from WiMax to MP3 audio, low-power/high-performance DSPs, color image processing, and chips on video. Drawing on the experience of leading engineers, researchers, and scholars, the three-volume set contains 29 new chapters that address multimedia and Internet technologies, tomography, radar systems, architecture, standards, and future applications in speech, acoustics, video, radar, and telecommunications. This volume, Video, Speech, and Audio Signal Processing and Associated Standards, provides thorough coverage of the basic foundations of speech, audio, image, and video processing and associated applications to broadcast, storage, search and retrieval, and communications.

This is the first International Conference on Advances in Computing (ICAdC-2012). The scope of the conference includes all the areas of New Theoretical Computer Science, Systems and Software, and Intelligent systems. Conference Proceedings is a culmination of research results, papers and the theory related to all the three major areas of computing mentioned above. Helps budding researchers, graduates in the areas of Computer Science, Information Science, Electronics, Telecommunication, Instrumentation, Networking to take forward their research work based on the reviewed results in the paper by mutual interaction through e-mail contacts in the proceedings.

Welcome to the second IEEE Pacific Rim Conference on Multimedia (IEEE PCM 2001) held in Zhongguanchun, Beijing, China, October 22 24, 2001. Building upon the success of the inaugural IEEE PCM 2000 in Sydney in December 2000, the second PCM again brought together the researchers, developers, practitioners, and educators of multimedia in the Pacific area. Theoretical breakthroughs and practical systems were presented at this conference, thanks to the sponsorship by the IEEE Circuit and Systems Society, IEEE Signal Processing Society, China Computer Foundation, China Society of Image and Graphics, National Natural Science Foundation of China, Tsinghua University, and Microsoft Research, China. IEEE PCM 2001 featured a comprehensive program including keynote talks, regular paper presentations, posters, demos, and special sessions. We received 244 papers and accepted only 104 of them as regular papers, and 53 as poster papers. Our special session chairs, Shin'ichi Satoh and Mohan Kankanhalli, organized 6 special sessions. We acknowledge the great contribution from our program committee members and paper reviewers who spent many hours reviewing submitted papers and providing valuable comments for the authors. The conference would not have been successful without the help of so many people. We greatly appreciated the support of our honorary chairs: Prof. Sun Yuan Kung of Princeton University, Dr. Ya Qin Zhang of Microsoft Research China, and Prof.

Video compression is not a new process; however, it is forever evolving. New standards, codecs, and ways of getting the job done are continually being created. Newcomers to video compression and seasoned veterans alike need to know how to harness the tools and use them for specific workflows for broadcast, the Web, Blu-rays, set-top boxes, digital cinema, and mobile devices. Here to guide you through the multitude of formats and confusing array of specifications, Andy Beach and Aaron Owen use a practical, straightforward approach to

explaining video compression. After covering the fundamentals of audio and video compression, they explore the current applications for encoding, discuss the common workflows associated with each, and then look at the most common delivery platforms. The book includes examples from the authors' projects as well as recipes that offer a way to define some of the best practices of video compression today. This invaluable resource gives you: proven techniques for delivering video online, or via disc or other devices. clear, straightforward explanations that cut through the jargon. step-by-step instructions for using a wide variety of encoding tools. workflow tips for performing either stand-alone or batch compressions. insight and advice from top compression professionals sprinkled throughout.

Digital Video ProcessingPrentice Hall

Useful as a reference work, this book offers a good balance between theoretical concepts and practical solutions, with more rigorous formulation of certain problems such as motion estimation, sampling, basic coding theory. Provides an in-depth exposition of fundamental theory and techniques for video processing, including frequency domain characterization of video signals and visual perception, video sampling and format conversion, two dimensional and three dimensional motion estimation. Also presents techniques important for video communications, including video coding and error control, and up-to-date coverage on recent international standards on video communications. A chapter is devoted to video streaming over Internet and wireless networks, one of the most popular video communication applications. In addition, it discusses processing and communications of stereoscopic and multiview video. Practicing researchers and engineers.

This book presents the proceedings of the Fourth International Workshop on Soft Computing as Transdisciplinary Science and Technology (WSTST '05), May 25-27, 2005, Muroran, Japan. It brings together the original work of international soft computing/computational intelligence researchers, developers, practitioners, and users. This proceedings provide contributions to all areas of soft computing including intelligent hybrid systems, agent-based systems, intelligent data mining, decision support systems, cognitive and reactive distributed artificial intelligence (AI), internet modelling, human interface, and applications in science and technology.

This book constitutes the refereed proceedings of the 4th International Conference on Articulated Motion and Deformable Objects, AMDO 2006, held in Port d'Andratx, Mallorca, Spain, in July 2006. Presents 53 carefully selected and revised full papers on topics including geometric and physical deformable models, motion analysis, articulated models and animation, modelling and visualisation of deformable models, deformable models applications, motion analysis applications, single or multiple human motion analysis and synthesis, and more.

This comprehensive and state-of-the art approach to video processing gives engineers and students a comprehensive introduction and includes full coverage of key applications: wireless video, video networks, video indexing and retrieval and use of video in speech processing. Containing all the essential methods in video processing alongside the latest standards, it is a complete resource for the professional engineer, researcher and graduate student. Numerous conceptual and numerical examples All the latest standards are thoroughly covered: MPEG-1, MPEG-2, MPEG-4, H.264 and AVC Coverage of the latest techniques in video security "Like its sister volume "The Essential Guide to Image Processing," Professor Bovik's Essential Guide to Video Processing provides a timely and comprehensive survey, with contributions from leading researchers in the area. Highly recommended for everyone with an interest in this fascinating and fast-moving field." —Prof. Bernd Girod, Stanford University, USA * Edited by a leading person in the field who created the IEEE International Conference on Image Processing, with contributions from experts in their fields. * Numerous conceptual and numerical examples *All the latest standards are thoroughly covered: MPEG-1, MPEG-2, MPEG-4, H.264 and AVC. * Coverage of the latest techniques in video security

ICIAR 2005, the International Conference on Image Analysis and Recognition, was the second ICIAR conference, and was held in Toronto, Canada. ICIAR is organized annually, and alternates between Europe and North America. ICIAR 2004 was held in Porto, Portugal. The idea of o?ering these conferences came as a result of discussion between researchers in Portugal and Canada to encourage collaboration and exchange, mainly between these two countries, but also with the open participation of other countries, addressing recent advances in theory, methodology and applications. Theresponsetothecallforpapersfor ICIAR2005wasencouraging.From295 full papers submitted, 153 were ?nally accepted (80 oral presentations, and 73 posters). The review process was carried out by the Program Committee m-bersandotherreviewers;allareexpertsinvariousimageanalysisandrecognition areas. Each paper was reviewed by at least two reviewers, and also checked by the conference co-chairs. The high quality of the papers in these proceedings is attributed ?rst to the authors,and second to the quality of the reviews provided by the experts. We would like to thank the authors for responding to our call, andwewholeheartedlythankthe reviewersfor theirexcellentwork,andfortheir timely response. It is this collective e?ort that resulted in the strong conference program and high-quality proceedings in your hands.

These transactions publish research in computer-based methods of computational collective intelligence (CCI) and their applications in a wide range of fields such as the semantic web, social networks, and multi-agent systems. TCCI strives to cover new methodological, theoretical and practical aspects of CCI understood as the form of intelligence that emerges from the collaboration and competition of many individuals (artificial and/or natural). The application of multiple computational intelligence technologies, such as fuzzy systems, evolutionary computation, neural systems, consensus theory, etc., aims to support human and other collective intelligence and to create new forms of CCI in natural and/or artificial systems. This thirty-second issue presents 5 selected papers in the field of management, economics and computer science.

The field of image restoration is concerned with the estimation of uncorrupted im ages from noisy, blurred ones. These blurs might be caused by optical distortions, object motion during imaging, or atmospheric turbulence. In many scientific and en gineering applications, such as aerial imaging, remote sensing, electron microscopy, and medical imaging, there is active or potential work in image restoration. The purpose of this book is to provide in-depth treatment of some recent

ad vances in the field of image restoration. A survey of the field is provided in the introduction. Recent research results are presented, regarding the formulation of the restoration problem as a convex programming problem, the implementation of restoration algorithms using artificial neural networks, the derivation of non stationary image models (compound random fields) and their application to image estimation and restoration, the development of algorithms for the simultaneous image and blur parameter identification and restoration, and the development of algorithms for restoring scanned photographic images. Special attention is directed to issues of numerical implementation. A large number of pictures demonstrate the performance of the restoration approaches. This book provides a clear understanding of the past achievements, a detailed description of the very important recent developments and the limitations of existing approaches, in the rapidly growing field of image restoration. It will be useful both as a reference book for working scientists and engineers and as a supplementary textbook in courses on image processing.

Over the years, thousands of engineering students and professionals relied on Digital Video Processing as the definitive, in-depth guide to digital image and video processing technology. Now, Dr. A. Murat Tekalp has completely revamped the first edition to reflect today's technologies, techniques, algorithms, and trends. Digital Video Processing, Second Edition, reflects important advances in image processing, computer vision, and video compression, including new applications such as digital cinema, ultra-high-resolution video, and 3D video. This edition offers rigorous, comprehensive, balanced, and quantitative coverage of image filtering, motion estimation, tracking, segmentation, video filtering, and compression. Now organized and presented as a true tutorial, it contains updated problem sets and new MATLAB projects in every chapter. Coverage includes Multi-dimensional signals/systems: transforms, sampling, and lattice conversion Digital images and video: human vision, analog/digital video, and video quality Image filtering: gradient estimation, edge detection, scaling, multi-resolution representations, enhancement, de-noising, and restoration Motion estimation: image formation; motion models; differential, matching, optimization, and transform-domain methods; and 3D motion and shape estimation Video segmentation: color and motion segmentation, change detection, shot boundary detection, video matting, video tracking, and performance evaluation Multi-frame filtering: motion-compensated filtering, multi-frame standards conversion, multi-frame noise filtering, restoration, and super-resolution Image compression: lossless compression, JPEG, wavelets, and JPEG2000 Video compression: early standards, ITU-T H.264/MPEG-4 AVC, HEVC, Scalable Video Compression, and stereo/multi-view approaches

The manipulation of pictures and video in digital form has been an established research activity for more than twenty years. It is only recently, however, that digital image and video processing equipment has been accessible to the gen eral public. This is due in part to the rapidly growing economy. of the home computer. A major contributing factor has been the marked rise in the pres ence of the non-academic user on the internet, particularly the World Wide Web (WWW). Manipulating digital imagery has become synonymous with the WWW. It is the drive to present audio and visual media to the home user in an interactive form and to increase the available range of choices, which has encouraged agreements to begin digital video television broadcasting before the turn of the century. With the increased demand for video material, there is a perceived increase in demand for material from archive sources and this has fuelled commercial interest in automatic digital restoration processes. Further more there is a continuing effort to design techniques for correcting errors in received compressed video bit streams for the purposes of live communications links over noisy channels e. g. mobile telephones and the internet. This book introduces the reader to a range of digital restoration activities beyond the well traversed areas of noise reduction and deblurring. It describes a number of problems associated with archived film and video.

Multimedia Systems discusses the basic characteristics of multimedia operating systems, networking and communication, and multimedia middleware systems. The overall goal of the book is to provide a broad understanding of multimedia systems and applications in an integrated manner: a multimedia application and its user interface must be developed in an integrated fashion with underlying multimedia middleware, operating systems, networks, security, and multimedia devices. Fundamental characteristics of multimedia operating and distributed communication systems are presented, especially scheduling algorithms and other OS supporting approaches for multimedia applications with soft-real-time deadlines, multimedia file systems and servers with their decision algorithms for data placement, scheduling and buffer management, multimedia communication, transport, and streaming protocols, services with their error control, congestion control and other Quality of Service aware and adaptive algorithms, synchronization services with their skew control methods, and group communication with their group coordinating algorithms and other distributed services.

Large volumes of video content can only be easily accessed by the use of rapid browsing and retrieval techniques. Constructing a video table of contents (ToC) and video highlights to enable end users to sift through all this data and find what they want, when they want are essential. This reference puts forth a unified framework to integrate these functions supporting efficient browsing and retrieval of video content. The authors have developed a cohesive way to create a video table of contents, video highlights, and video indices that serve to streamline the use of applications in consumer and surveillance video applications. The authors discuss the generation of table of contents, extraction of highlights, different techniques for audio and video marker recognition, and indexing with low-level features such as color, texture, and shape. Current applications including this summarization and browsing technology are also reviewed. Applications such as event detection in elevator surveillance, highlight extraction from sports video, and image and video database management are considered within the proposed framework. This book presents the latest in research and readers will find their search for knowledge completely satisfied by the breadth of the information covered in this volume. * Offers the latest in cutting edge research and applications in surveillance and consumer video * Presentation of a novel unified framework aimed at successfully sifting through the abundance of footage gathered daily at shopping malls, airports, and other commercial facilities * Concisely written by leading contributors in the signal processing industry with step-by-step instruction in building video ToC and indices

Now available in a three-volume set, this updated and expanded edition of the bestselling Digital Signal Processing Handbook continues to provide the engineering community with authoritative coverage of the fundamental and specialized aspects of information-bearing signals in digital form. Encompassing essential background material, technical details, standards, and software, The Digital Signal Processing Handbook, Second Edition reflects cutting-edge information on signal processing algorithms and protocols related to speech, audio, multimedia, and video processing technology associated with standards ranging from WiMax to MP3 audio, low-power/high-performance DSPs, color image processing, and chips on video. The three-volume set draws on the experience of leading engineers, researchers, and scholars and includes 29 new chapters that address multimedia and Internet technologies, tomography, radar systems, architecture, standards, and future applications in speech, acoustics, video, radar, and telecommunications. Each volume in the set is also available individually ... Emphasizing theoretical concepts, Digital Signal Processing Fundamentals (Catalog no. 46063) provides comprehensive coverage of the basic foundations of DSP. Coverage includes: Signals and Systems, Signal Representation and Quantization, Fourier Transforms, Digital Filtering, Statistical Signal Processing, Adaptive Filtering, Inverse Problems and Signal Reconstruction, and Time–Frequency and Multirate Signal Processing. Wireless, Networking, Radar, Sensor Array Processing, and Nonlinear Signal Processing (Catalog no. 46047) thoroughly covers the foundations of signal processing related to wireless, radar, space–time coding, and mobile communications together with associated applications to networking, storage, and communications. Video, Speech, and Audio Signal Processing and Associated Standards, (Catalog no. 4608X) details the basic foundations of speech, audio, image, and video processing and

associated applications to broadcast, storage, search and retrieval, and communications.

This book constitutes the refereed proceedings of the International Conference on Embedded and Ubiquitous Computing, EUC 2004, held in Aizu-Wakamatsu City, Japan, in August 2004. The 104 revised full papers presented were carefully reviewed and selected from more than 260 submissions. The papers are organized in topical sections on embedded hardware and software; real-time systems; power-aware computing; hardware/software codesign and systems-on-chip; mobile computing; wireless communication; multimedia and pervasive computing; agent technology and distributed computing, network protocols, security, and fault-tolerance; and middleware and peer-to-peer computing.

The digital transformation is in full swing and fundamentally changes how we live, work, and communicate with each other. From retail to finance, many industries see an inflow of new technologies, disruption through innovative platform business models, and employees struggling to cope with the significant shifts occurring. This Fourth Industrial Revolution is predicted to also transform Logistics and Supply Chain Management, with delivery systems becoming automated, smart networks created everywhere, and data being collected and analyzed universally. The Digital Transformation of Logistics: Demystifying Impacts of the Fourth Industrial Revolution provides a holistic overview of this vital subject clouded by buzz, hype, and misinformation. The book is divided into three themed-sections: Technologies such as self-driving cars or virtual reality are not only electrifying science fiction lovers anymore, but are also increasingly presented as cure-all remedies to supply chain challenges. In The Digital Transformation of Logistics: Demystifying Impacts of the Fourth Industrial Revolution, the authors peel back the layers of excitement that have grown around new technologies such as the Internet of Things (IoT), 3D printing, Robotic Process Automation (RPA), Blockchain or Cloud computing, and show use cases that give a glimpse about the fascinating future we can expect. Platforms that allow businesses to centrally acquire and manage their logistics services disrupt an industry that has been relationship-based for centuries. The authors discuss smart contracts, which are one of the most exciting applications of Blockchain, Software as a Service (SaaS) offerings for freight procurement, where numerous data sources can be integrated and decision-making processes automated, and marine terminal operating systems as an integral node for shipments. In The Digital Transformation of Logistics: Demystifying Impacts of the Fourth Industrial Revolution, insights are shared into the cold chain industry where companies respond to increasing quality demands, and how European governments are innovatively responding to challenges of cross-border eCommerce. People are a vital element of the digital transformation and must be on board to drive change. The Digital Transformation of Logistics: Demystifying Impacts of the Fourth Industrial Revolution explains how executives can create sustainable impact and how competencies can be managed in the digital age - especially for sales executives who require urgent upskilling to remain relevant. Best practices are shared for organizational culture change, drawing on studies among senior leaders from the US, Singapore, Thailand, and Australia, and for managing strategic alliances with logistics service providers to offset risks and create cross-functional, cross-company transparency. The Digital Transformation of Logistics: Demystifying Impacts of the Fourth Industrial Revolution provides realistic insights, a ready-to-use knowledge base, and a working vocabulary about current activities and emerging trends of the Logistics industry. Intended readers are supply chain professionals working for manufacturing, trading, and freight forwarding companies as well as students and all interested parties.