

Mpeg 4

Atul Puri

H.264 and MPEG-4 Video Compression Iain E. Richardson, 2004-02-06 Following on from the successful MPEG-2 standard, MPEG-4 Visual is enabling a new wave of multimedia applications from Internet video streaming to mobile video conferencing. The new H.264 'Advanced Video Coding' standard promises impressive compression performance and is gaining support from developers and manufacturers. The first book to cover H.264 in technical detail, this unique resource takes an application-based approach to the two standards and the coding concepts that underpin them. Presents a practical, step-by-step, guide to the MPEG-4 Visual and H.264 standards for video compression. Introduces the basic concepts of digital video and covers essential background material required for an understanding of both standards. Provides side-by-side performance comparisons of MPEG-4 Visual and H.264 and advice on how to approach and interpret them to ensure conformance. Examines the way that the standards have been shaped and developed, discussing the composition and procedures of the VCEG and MPEG standardisation groups. Focussing on compression tools and profiles for practical multimedia applications, this book 'decodes' the standards, enabling developers, researchers, engineers and students to rapidly get to grips with both H.264 and MPEG-4 Visual. Dr Iain Richardson leads the Image Communication Technology research group at the Robert Gordon University in Scotland and is the author of over 40 research papers and two previous books on video compression technology.

The MPEG-4 Book Fernando C. N. Pereira, Touradj Ebrahimi, 2002 In this book, two leaders of the MPEG-4 standards community offer an in-depth, targeted guide to the MPEG-4 standard and its use in real, cutting-edge applications. The authors demonstrate how MPEG-4 addresses the rapidly evolving needs of telecommunications, broadcast, interactive, and converged applications more successfully than any previous standard.

Understanding MPEG 4 Sebastian Moeritz, Klaus Diepold, 2012-09-10 The Practical Guide to MPEG 4 offers an up to date introduction to this important interactive and multimedia compression standard (including MPEG-4 Part 10), with real examples and information as to how and where this new technology should be used. All aspects of MPEG-4 that are relevant in today's technical landscape are described in this book, including video and audio creation, production, distribution, reception and consumption environment. This book explains everything you really need to know in jargon-free language: interactive systems, content management, deployment, licensing and business models.

MPEG-4 Beyond Conventional Video Coding Mihaela van der Schaar, Deepak S. Turaga, Thomas Stockhammer, 2006 An important merit of the MPEG-4 video standard is that it not only provided tools and algorithms for enhancing the compression efficiency of existing MPEG-2 and H.263 standards, but also contributed key innovative solutions for new multimedia applications such as: real-time video streaming to PCs and cell-phones over Internet and wireless networks, interactive services, and multimedia access. Many of these solutions are currently used in practice or have been important step-stones for new standards and technologies. In this lecture, the authors focus on three key innovations of MPEG-4 video that will continue to serve as an inspiration and basis for emerging standards, products, and technologies. The three topics highlighted in this lecture are object based coding and scalability, Fine Granularity Scalability (FGS), and error resilience tools. This lecture is aimed at engineering students as well as professionals interested in learning about these MPEG-4 technologies for multimedia streaming and interaction. Finally, this lecture is not aimed as a substitute or manual for the MPEG-4 standard, but rather as a tutorial focused on the principles and algorithms underlying it.

MPEG-4 Beyond Conventional Video Coding Mihaela van der Schaar, Deepak S. Turaga, Thomas Stockhammer, 2022-05-31 An important merit of the MPEG-4 video

standard is that it not only provided tools and algorithms for enhancing the compression efficiency of existing MPEG-2 and H.263 standards but also contributed key innovative solutions for new multimedia applications such as real-time video streaming to PCs and cell phones over Internet and wireless networks, interactive services, and multimedia access. Many of these solutions are currently used in practice or have been important stepping-stones for new standards and technologies. In this book, we do not aim at providing a complete reference for MPEG-4 video as many excellent references on the topic already exist. Instead, we focus on three topics that we believe formed key innovations of MPEG-4 video and that will continue to serve as an inspiration and basis for new, emerging standards, products, and technologies. The three topics highlighted in this book are object-based coding and scalability, Fine Granularity Scalability, and error resilience tools. This book is aimed at engineering students as well as professionals interested in learning about these MPEG-4 technologies for multimedia streaming and interaction. Finally, it is not aimed as a substitute or manual for the MPEG-4 standard, but rather as a tutorial focused on the principles and algorithms underlying it.

Delivering MPEG-4 Based Audio-Visual Services Hari Kalva, 2006-04-11 Delivering MPEG-4 Based Audio-Visual Services investigates the different aspects of end-to-end multimedia services; content creation, server and service provider, network, and the end-user terminal. Part I provides a comprehensive introduction to digital video communications, MPEG standards, and technologies, and deals with system level issues including standardization and interoperability, user interaction, and the design of a distributed video server. Part II investigates the systems in the context of object-based multimedia services and presents a design for an object-based audio-visual terminal, some of these features having been adopted by the MPEG-4 Systems specification. The book goes on to study the requirements for a file format to represent object-based audio-visual content and the design of one such format. The design introduces new concepts such as direct streaming that are essential for scalable servers. The final part of the book examines the delivery of object-based multimedia presentations and gives optimal algorithms for multiplex-scheduling of object-based audio-visual presentations, showing that the audio-visual object scheduling problem is NP-complete in the strong sense. The problem of scheduling audio-visual objects is similar to the problem of sequencing jobs on a single machine. The book compares these problems and adapts job-sequencing results to audio-visual object scheduling, and provides optimal algorithms for scheduling presentations under resource constraints, such as bandwidth (network constraints) and buffer (terminal constraints). In addition, the book presents algorithms that minimize the resources required for scheduling presentations and the auxiliary capacity required to support interactivity in object-based audio-visual presentations. Delivering MPEG-4 Based Audio-Visual Services is essential reading for researchers and practitioners in the areas of multimedia systems engineering and multimedia computing, network professionals, service providers, and all scientists and technical managers interested in the most up-to-date MPEG standards and technologies.

The MPEG Handbook John Watkinson, 2012-09-10 A complete, professional 'bible' on all aspects of audio and video compression using MPEG technology, including the MPEG-4 standard and, in this second edition, H-264. The clarity of explanation and depth of technical detail combine to make this book an essential and definitive reference work. THE MPEG HANDBOOK is both a theoretical and practical treatment of the subject. Fundamental knowledge is provided alongside practical guidance on how to avoid pitfalls and poor quality. The often-neglected issues of reconstructing the signal timebase at the decoder and of synchronizing the signals in a multiplex are treated fully here. Previously titled MPEG-2, the book is frequently revised to cover the latest applications of the technology.

Understanding MPEG 4 Sebastian Moeritz, Klaus Diepold, 2012 The Practical Guide to MPEG 4 offers an up to date introduction to this important interactive and multimedia compression standard (including MPEG-4 Part 10), with real examples and information as to how and where this new technology should be used. All aspects of MPEG-4 that are relevant in today's technical landscape are described in this book, including video and audio creation, production, distribution, reception and consumption environment. This book explains everything you really need to know in jargon-free language: interactive systems, content management, deployment, licensing and business models.

Algorithms, Complexity Analysis and VLSI Architectures for MPEG-4 Motion Estimation Peter M. Kuhn, 2013-06-29 MPEG-4 is the multimedia standard for combining interactivity, natural and synthetic digital video, audio and computer-graphics. Typical applications are: internet, video conferencing, mobile videophones, multimedia cooperative work, teleteaching and games. With MPEG-4 the next step from block-based video (ISO/IEC MPEG-1, MPEG-2, CCITT H.261, ITU-T H.263) to arbitrarily-shaped visual objects is taken. This significant step demands a new methodology for system analysis and design to meet the considerably higher flexibility of MPEG-4. Motion estimation is a central part of MPEG-1/2/4 and H.261/H.263 video compression standards and has attracted much attention in research and industry, for the following reasons: it is computationally the most demanding algorithm of a video encoder (about 60-80% of the total computation time), it has a high impact on the visual quality of a video encoder, and it is not standardized, thus being open to competition. Algorithms, Complexity Analysis, and VLSI Architectures for MPEG-4 Motion Estimation covers in detail every single step in the design of a MPEG-1/2/4 or H.261/H.263 compliant video encoder: Fast motion estimation algorithms Complexity analysis tools Detailed complexity analysis of a software implementation of MPEG-4 video Complexity and visual quality analysis of fast motion estimation algorithms within MPEG-4 Design space on motion estimation VLSI architectures Detailed VLSI design examples of (1) a high throughput and (2) a low-power MPEG-4 motion estimator. Algorithms, Complexity Analysis and VLSI Architectures for MPEG-4 Motion Estimation is an important introduction to numerous algorithmic, architectural and system design aspects of the multimedia standard MPEG-4. As such, all researchers, students and practitioners working in image processing, video coding or system and VLSI design will find this book of interest.

Introduction to MPEG; Lawrence Harte, April Wiblitzhouser, Tomas Pazderka, 2006 This book explains the fundamentals of how MPEG works and how MPEG is used in cable television, satellite systems, mobile telecom and Internet television systems. You will discover the basics of audio and video digitization and compression and the standard formats that are used in MPEG files. Introduction to MPEG explains the processes that control media flow and timing synchronization along with how MPEG transmission can monitor and control audio and video quality. You will discover about video compression, streaming services and media control protocols. MPEG has the capability of providing multiple media channels including data channels that can provide media information such as play list titles, artists and media descriptions. You will learn how these channels are combined and time synchronized along with how to manage quality of service (QoS). You will learn how MPEG audio coders can range from low complexity (layer 1) to high complexity (layer 3) including a new AAC that has improved compression performance than MP3. MPEG video coders range from simple digital video compression technologies used in MPEG-1 to complex multi-object compression used in MPEG-4. Various compression technologies such as motion estimation and compression scalability are described. Discover how the MPEG system groups image elements (pixels) within each image (frame) into small blocks, which are grouped into macroblocks. Macroblocks can be combined into slices and each image may contain several slices. Learn how slices make up

frames, which come in several different types and how different types of frames can be combined into a group of pictures (GOP). Explanations of how MPEG transmission can combine, send and manage the transmission of multiple forms of information (multimedia) is also provided. You will learn that MPEG systems are composed of various types of streams ranging from the basic raw data stream (elementary streams) to stream that contain a single television video (a program stream) or a stream that combines multiple programs (transport streams). The different frame types including independent reference frames (I-frames), predicted frames (P-frames), bi-directionally predicted frames (B-Frames) and DC frames (basic block reference levels) are described. Learn how MPEG transmission systems regularly broadcast tables that describe programs, program components or other information that is related to the delivery and decoding of programs. Discover how MPEG standards use profiles to define required protocols and actions that enable the providing of features and services for particular MPEG applications. These applications range from providing standard television services over a broadcast system to providing video services on a mobile wireless network. Some of the most important topics featured are: .How MPEG Works .Audio Compression .Video Compression .Digital Quantization .Transmission Formats .Media Streams .Frame Types .Program Tables .Channel Multiplexing .Profiles and Levels

MPEG-4 Jump-start Aaron E. Walsh, Mikaël Bourges-Sévenier, 2002 PLEASE PROVIDE COURSE INFORMATION PLEASE PROVIDE

MPEG-4 Facial Animation Igor S. Pandzic, Robert Forchheimer, 2003-01-31 Provides several examples of applications using the MPEG-4 Facial Animation standard, including video and speech analysis. Covers the implementation of the standard on both the encoding and decoding side. Contributors includes individuals instrumental in the standardization process.

Digital Video: An Introduction to MPEG-2 Barry G. Haskell, Atul Puri, Arun N. Netravali, 2007-05-08 Digital Video offers comprehensive coverage of the MPEG-2 audio/visual digital compression standard. The treatment includes the specifics needed to implement an MPEG-2 Decoder, including the syntax and semantics of the coded bitstreams. Since the MPEG-2 Encoders are not specified by the standard, and are actually closely held secrets of many vendors, the book only outlines the fundamentals of encoder design and algorithm optimization.

Video coding standards K.R. Rao, Do Nyeon Kim, Jae Jeong Hwang, 2013-10-07 The requirements for multimedia (especially video and audio) communications increase rapidly in the last two decades in broad areas such as television, entertainment, interactive services, telecommunications, conference, medicine, security, business, traffic, defense and banking. Video and audio coding standards play most important roles in multimedia communications. In order to meet these requirements, series of video and audio coding standards have been developed such as MPEG-2, MPEG-4, MPEG-21 for audio and video by ISO/IEC, H.26x for video and G.72x for audio by ITU-T, Video Coder 1 (VC-1) for video by the Society of Motion Picture and Television Engineers (SMPTE) and RealVideo (RV) 9 for video by Real Networks. AVS China is the abbreviation for Audio Video Coding Standard of China. This new standard includes four main technical areas, which are systems, video, audio and digital copyright management (DRM), and some supporting documents such as consistency verification. The second part of the standard known as AVS1-P2 (Video - Jizhun) was approved as the national standard of China in 2006, and several final drafts of the standard have been completed, including AVS1-P1 (System - Broadcast), AVS1-P2 (Video - Zengqiang), AVS1-P3 (Audio - Double track), AVS1-P3 (Audio - 5.1), AVS1-P7 (Mobile Video), AVS-S-P2 (Video) and AVS-S-P3 (Audio). AVS China provides a technical solution for many applications such as digital broadcasting (SDTV and HDTV), high-density storage media, Internet streaming media, and will be used in the

domestic IPTV, satellite and possibly the cable TV market. Comparing with other coding standards such as H.264 AVC, the advantages of AVS video standard include similar performance, lower complexity, lower implementation cost and licensing fees. This standard has attracted great deal of attention from industries related to television, multimedia communications and even chip manufacturing from around the world. Also many well known companies have joined the AVS Group to be Full Members or Observing Members. The 163 members of AVS Group include Texas Instruments (TI) Co., Agilent Technologies Co. Ltd., Envivio Inc., NDS, Philips Research East Asia, Aisino Corporation, LG, Alcatel Shanghai Bell Co. Ltd., Nokia (China) Investment (NCIC) Co. Ltd., Sony (China) Ltd., and Toshiba (China) Co. Ltd. as well as some high level universities in China. Thus there is a pressing need from the instructors, students, and engineers for a book dealing with the topic of AVS China and its performance comparisons with similar standards such as H.264, VC-1 and RV-9.

The Handbook of MPEG Applications Marios C. Angelides, Harry Agius, 2010-11-11 This book provides a comprehensive examination of the use of MPEG-2, MPEG-4, MPEG-7, MPEG-21, and MPEG-A standards, providing a detailed reference to their application. In this book, the authors address five leading MPEG standards: MPEG-2, MPEG-4, MPEG-7, MPEG-21, and MPEG-A, focusing not only on the standards themselves, but specifically upon their application (e.g. for broadcasting media, personalised advertising and news, multimedia collaboration, digital rights management, resource adaptation, digital home systems, and so on); including MPEG cross-breed applications. In the evolving digital multimedia landscape, this book provides comprehensive coverage of the key MPEG standards used for generation and storage, distribution and dissemination, and delivery of multimedia data to various platforms within a wide variety of application domains. It considers how these MPEG standards may be used, the context of their use, and how supporting and complementary technologies and the standards interact and add value to each other. Key Features: Integrates the application of five popular MPEG standards (MPEG-2, MPEG-4, MPEG-7, MPEG-21, and MPEG-A) into one single volume, including MPEG cross-breed applications Up-to-date coverage of the field based on the latest versions of the five MPEG standards Opening chapter provides overviews of each of the five MPEG standards Contributions from leading MPEG experts worldwide Includes an accompanying website with supporting material (www.wiley.com/go/angelides_mpeg) This book provides an invaluable reference for researchers, practitioners, CTOs, design engineers, and developers. Postgraduate students taking MSc, MRes, MPhil and PhD courses in computer science and engineering, IT consultants, and system developers in the telecoms, broadcasting and publishing sectors will also find this book of interest.

Fundamentals and Evolution of MPEG-2 Systems Jan Van der Meer, 2014-03-20 This book describes the fundamentals and details of MPEG-2 Systems technology Written by an expert in the field, this book examines the MPEG-2 system specification as developed in the early 1990's, as well as its evolution into the fourth edition of the MPEG-2 systems standard, published in 2013. While MPEG-2 systems will continue to evolve further, this book describes the MPEG-2 system functionality as of October 2013. Furthermore, relevant background information is provided. The discussion of MPEG-2 system functionality requires knowledge of various fundamental issues, such as timing, and supported content formats. Therefore also some basic information on video and audio coding is provided, including their evolution. Also other content formats supported in MPEG-2 systems are described, as far as needed to understand MPEG-2 systems. Ordered logically working from the basics and background through to the details and fundamentals of MPEG-2 transport streams and program streams Explores important issues within the standardization process itself Puts the developments on MPEG-2 systems into historic perspective Includes support of 3D Video and transport of AVC, SVC and MVC

Concludes with additional issues such as real-time interface, delivery over IP networks and usage by application standardization bodies Predicts a continuing promising future for MPEG-2 transport streams

Multimedia Systems, Standards, and Networks Atul Puri, 2000-03-22 Describes ITU H.323 and H.324, H.263, ITU-T video, and MPEG-4 standards, systems, and coding; IP and ATM networks; multimedia search and retrieval; image retrieval in digital laboratories; and the status and direction of MPEG-7.

High-fidelity Multichannel Audio Coding Dai Tracy Yang, Chris Kyriakakis, Chung-Chieh Jay Kuo, 2005 This invaluable monograph addresses the specific needs of audio-engineering students and researchers who are either learning about the topic or using it as a reference book on multichannel audio compression. This book covers a wide range of knowledge on perceptual audio coding, from basic digital signal processing and data compression techniques to advanced audio coding standards and innovative coding tools. It is the only book available on the market that solely focuses on the principles of high-quality audio codec design for multichannel sound sources. This book includes three parts. The first part covers the basic topics on audio compression, such as quantization, entropy coding, psychoacoustic model, and sound quality assessment. The second part of the book highlights the current most prevalent low-bit-rate high-performance audio coding standards-MPEG-4 audio. More space is given to the audio standards that are capable of supporting multichannel signals, that is, MPEG advanced audio coding (AAC), including the original MPEG-2 AAC technology, additional MPEG-4 toolsets, and the most recent AAC Plus standard. The third part of this book introduces several innovative multichannel audio coding tools, which have been demonstrated to further improve the coding performance and expand the available functionalities of MPEG AAC, and is more suitable for graduate students and researchers in the advanced level. Dai Tracy Yang is currently Postdoctoral Research Fellow, Chris Kyriakakis is Associated Professor, and C.-C. Jay Kuo is Professor, all affiliated with the Integrated Media Systems Center (IMSC) at the University of Southern California.

IPTV and Internet Video Wes Simpson, Howard Alan Greenfield, 2007 Make the right IPTV business decisions with a thorough understanding of the technology and the business implications of the broadband video revolution. Master key trends transforming the world of broadcast television and the Web with this guide to hardware, software, Internet applications and the wide range of alternative products and services. Explore why IP is the new gold standard for online video delivery and how it will be monetized. Understand the entire IPTV process, with clear explanations of complex technologies designed to help leaders make informed decisions and drive successful strategies. This comprehensive guide prepares you for IPTV's rapid deployment and future growth with features that include: Clear explanations of IPTV and Internet Video networks and applications
Overviews of how the technical solutions are being turned into business models
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An expanded glossary that clarifies complex, technical jargon * Reality Check perspectives throughout each chapter tie theory to real-world case studies * Expanded glossary clarifies complex technical jargon * Includes clear explanations of complex technologies, for both technical and non-technical professionals.

Video Demystified Keith Jack, 2004-09-21 This international bestseller and essential reference is the bible for digital video engineers and programmers worldwide. This is by far the most informative analog and digital video reference available, includes the hottest new trends and cutting-edge developments in the field. Video Demystified, Fourth Edition is a one stop reference guide for the various digital video technologies. The fourth edition is completely updated with all new chapters on MPEG-4, H.264, SDTV/HDTV, ATSC/DVB, and Streaming Video (Video over DSL, Ethernet, etc.), as well as discussions of the latest

standards throughout. The accompanying CD-ROM is updated to include a unique set of video test files in the newest formats. *This essential reference is the bible for digital video engineers and programmers worldwide *Contains all new chapters on MPEG-4, H.264, SDTV/HDTV, ATSC/DVB, and Streaming Video *Completely revised with all the latest and most up-to-date industry standards

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