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Complexity- Aware High Efficiency Video Coding

 Springer

Complexity Aware High Efficiency Video Coding

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Complexity Aware High Efficiency Video Coding:

Complexity-Aware High Efficiency Video Coding Guilherme Corrêa, Pedro Assunção, Luciano Agostini, Luis A. da Silva Cruz, 2015-12-29 This book discusses computational complexity of High Efficiency Video Coding HEVC encoders with coverage extending from the analysis of HEVC compression efficiency and computational complexity to the reduction and scaling of its encoding complexity After an introduction to the topic and a review of the state of the art research in the field the authors provide a detailed analysis of the HEVC encoding tools compression efficiency and computational complexity Readers will benefit from a set of algorithms for scaling the computational complexity of HEVC encoders all of which take advantage from the flexibility of the frame partitioning structures allowed by the standard The authors also provide a set of early termination methods based on data mining and machine learning techniques which are able to reduce the computational complexity required to find the best frame partitioning structures The applicability of the proposed methods is finally exemplified with an encoding time control system that employs the best complexity reduction and scaling methods presented throughout the book The methods presented in this book are especially useful in power constrained portable multimedia devices to reduce energy consumption and to extend battery life They can also be applied to portable and non portable multimedia devices operating in real time with limited computational resources

High Efficiency Video Coding and Other Emerging Standards K.R. Rao, J.J. Hwang, D.N. Kim, 2022-09-01 High Efficiency Video Coding and Other Emerging Standards provides an overview of high efficiency video coding HEVC and all its extensions and profiles There are nearly 300 projects and problems included and about 400 references related to HEVC alone Next generation video coding NGVC beyond HEVC is also described Other video coding standards such as AVS2 DAALA THOR VP9 Google DIRAC VC1 and AV1 are addressed and image coding standards such as JPEG JPEG LS JPEG2000 JPEG XR JPEG XS JPEG XT and JPEG Pleno are also listed Understanding of these standards and their implementation is facilitated by overview papers standards documents reference software software manuals test sequences source codes tutorials keynote speakers panel discussions reflector and ftp web sites all in the public domain Access to these categories is also provided

Algorithms for Efficient and Fast 3D-HEVC Depth Map Encoding Gustavo Sanchez, Luciano Agostini, César Marcon, 2019-08-20 This book describes and analyzes in detail the encoding effort and the encoding tool usage applied to 3D HEVC depth map coding Based on the analyzed information the authors introduce efficient algorithms for accelerating the available encoding tools The contributions discussed in this book include four algorithms for reducing intra frame encoding effort and three algorithms for reducing inter frame encoding effort The presented results demonstrate several levels of encoding effort reduction with different impacts in the encoding efficiency surpassing state of the art solutions by more than 50% the encoding effort with only 0.3% encoding efficiency loss

Image Processing: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources, 2013-05-31 Advancements in digital technology continue to

expand the image science field through the tools and techniques utilized to process two dimensional images and videos Image Processing Concepts Methodologies Tools and Applications presents a collection of research on this multidisciplinary field and the operation of multi dimensional signals with systems that range from simple digital circuits to computers This reference source is essential for researchers academics and students in the computer science computer vision and electrical engineering fields Intelligent Multimedia Technologies for Networking Applications: Techniques and Tools Kanellopoulos, Dimitris, 2013-01-31 As ubiquitous multimedia applications benefit from the rapid development of intelligent multimedia technologies there is an inherent need to present frameworks techniques and tools that adopt these technologies to a range of networking applications Intelligent Multimedia Technologies for Networking Applications Techniques and Tools promotes the discussion of specific solutions for improving the quality of multimedia experience while investigating issues arising from the deployment of techniques for adaptive video streaming This reference source provides relevant theoretical frameworks and leading empirical research findings and is suitable for practitioners and researchers in the area of multimedia technology

Smart Algorithms for Multimedia and Imaging Michael N. Rychagov, Ekaterina V. Tolstaya, Mikhail Y.

Sirotenko, 2021-05-05 This book presents prospective industrially proven methods and software solutions for storing processing and viewing multimedia content on digital cameras camcorders TV and mobile devices Most of the algorithms described here are implemented as systems on chip firmware or as software products and have low computational complexity and memory consumption In the four parts of the book which contains a total of 16 chapters the authors address solutions for the conversion of images and videos by super resolution depth estimation and control and mono to stereo 2D to 3D conversion display applications by video editing the real time detection of sport episodes and the generation and reproduction of natural effects The practical principles of machine learning are illustrated using technologies such as image classification as a service mobile user profiling and automatic view planning with dictionary based compressed sensing in magnetic resonance imaging The implementation of these technologies in mobile devices is discussed in relation to algorithms using a depth camera based on a colour coded aperture the animated graphical abstract of an image a motion photo and approaches and methods for iris recognition on mobile platforms The book reflects the authors practical experience in the development of algorithms for industrial R Offers essential algorithms for the processing pipeline in multimedia devices and accompanying software tools Features advanced topics on data processing addressing current technology challenges Hardware Design for 3D Video Coding Vladimir Afonso, Murilo Perleberg, Bruno Zatt, Marcelo Porto, Luciano Agostini, Altamiro Susin, 2025-02-19 This book focuses on the research and development challenges posed by 3D video systems based on multi view plus depth MVD technology This technology can produce a realistic immersive experience generating synthetic video views on the decoder side reducing the amount of information on the encoder side The discussion presented in this book explores the MVD characteristics to propose high throughput and energy efficient

architectures systems focusing on 3D HEVC the state of the art standard for exploiting the MVD concept The book includes an extensive discussion of the 3D HEVC video encoding followed by an in depth evaluation of the 3D HEVC reference software behavior Then the book presents in detail a set of high throughput and energy efficient architectures targeting the three main prediction steps inside the 3D HEVC intra frame prediction inter frame prediction and inter view prediction

Computational Intelligence Techniques for Green Smart Cities Mohamed Lahby,Ala Al-Fuqaha,Yassine Maleh,2022-04-22 This book contains high quality and original research on computational intelligence for green smart cities research In recent years the use of smart city technology has rapidly increased through the successful development and deployment of Internet of Things IoT architectures The citizens quality of life has been improved in several sensitive areas of the city such as transportation buildings health care education environment and security thanks to these technological advances Computational intelligence techniques and algorithms enable a computational analysis of enormous data sets to reveal patterns that recur This information is used to inform and improve decision making at the municipal level to build smart computational intelligence techniques and sustainable cities for their citizens Machine intelligence allows us to identify trends patterns The smart city could better integrate its transportation network for example By offering a better public transportation network adapted to the demand we could reduce personal vehicles and energy consumption A smart city could use models to predict the consequences of a change such as pedestrianizing a street or adding a bike lane A city can even create a 3D digital twin to test hypothetical projects This book comprises many state of the art contributions from scientists and practitioners working in machine intelligence and green smart cities It aspires to provide a relevant reference for students researchers engineers and professionals working in this area or those interested in grasping its diverse facets and exploring the latest advances in machine intelligence for green and sustainable smart city applications Resource

Management in Mobile Computing Environments Constandinos X. Mavromoustakis,Evangelos Pallis,George Mastorakis,2014-06-09 This book reports the latest advances on the design and development of mobile computing systems describing their applications in the context of modeling analysis and efficient resource management It explores the challenges on mobile computing and resource management paradigms including research efforts and approaches recently carried out in response to them to address future open ended issues The book includes 26 rigorously refereed chapters written by leading international researchers providing the readers with technical and scientific information about various aspects of mobile computing from basic concepts to advanced findings reporting the state of the art on resource management in such environments It is mainly intended as a reference guide for researchers and practitioners involved in the design development and applications of mobile computing systems seeking solutions to related issues It also represents a useful textbook for advanced undergraduate and graduate courses addressing special topics such as mobile and ad hoc wireless networks peer to peer systems for mobile computing novel resource management techniques in cognitive radio networks and

power management in mobile computing systems **Multimedia Networking and Coding** Farrugia, Reuben A., Debono, Carl J., 2012-12-31 Advances in multimedia communication systems have enhanced the need for improved video coding standards Due to the inherent nature of video content large bandwidths and reliable communication links are required to ensure a satisfactory level of quality experience inspiring industry and research communities to concentrate their efforts in this emerging research area Multimedia Networking and Coding covers widespread knowledge and research as well as innovative applications in multimedia communication systems This book highlights recent techniques that can evolve into future multimedia communication systems also showing experimental results from systems and applications

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