

Ann Ukhanova - DTU Orbit (11/08/2016)

Ann Ukhanova

Organisations

Department of Photonics Engineering

28/01/2009 → 22/01/2014 Former
annuk@fotonik.dtu.dk
VIP

Industrial Postdoc, Department of Photonics Engineering

18/08/2009 → 31/10/2013 Former
annuk@fotonik.dtu.dk
VIP

Coding and Visual Communication

25/02/2012 → 31/10/2013 Former
VIP

Publications:

Quality Assessment of Compressed Video for Automatic License Plate Recognition.

Definition of video quality requirements for video surveillance poses new questions in the area of quality assessment. This paper presents a quality assessment experiment for an automatic license plate recognition scenario. We explore the influence of the compression by H.264/AVC and H.265/HEVC standards on the recognition performance. We compare logarithmic and logistic functions for quality modeling. Our results show that a logistic function can better describe the dependence of recognition performance on the quality for both compression standards. We observe that automatic license plate recognition in our study has a behavior similar to human recognition, allowing the use of the same mathematical models. We furthermore propose an application of one of the models for video surveillance systems

General information

State: Published

Organisations: Department of Photonics Engineering, Coding and Visual Communication, Milestone Systems A/S

Authors: Ukhanova, A. (Intern), Støttrup-Andersen, J. (Intern), Forchhammer, S. (Intern), Madsen, J. (Ekstern)

Keywords: (Quality Assessment, Video Surveillance, License Plate Recognition, Compression)

Publication date: 2014

Host publication information

Title of host publication: Proceedings of International Conference on Computer Vision Theory and Applications

BFI conference series: Computer Vision Theory and Applications (c9bc9a25-cd4a-41b6-ba3e-b68ac41df01e)

Main Research Area: Technical/natural sciences

Conference: International Conference on Computer Vision Theory and Applications, Lisbon, Portugal, 05/01/2014 - 05/01/2014

DOIs:

10.5220/0004671203060313

Publication: Research - peer-review › Article in proceedings – Annual report year: 2014

Frame Rate versus Spatial Quality: Which Video Characteristics Do Matter?

Several studies have shown that the relationship between perceived video quality and frame rate is dependent on the video content. In this paper, we have analyzed the content characteristics and compared them against the subjective results derived from preference decisions between different spatial and temporal quality levels. We also propose simple yet powerful metrics for characterizing spatial and temporal properties of a video sequence, and demonstrate how these metrics can be applied for evaluating the relative impact of spatial and temporal quality on the perceived overall quality.

General information

State: Published

Organisations: Department of Photonics Engineering, Coding and Visual Communication, Norwegian University of Science and Technology

Authors: Korhonen, J. (Intern), Reiter, U. (Ekstern), Ukhanova, A. (Intern)

Keywords: (Video quality, Frame rate impact)

Number of pages: 6

Publication date: 2013

Host publication information

Title of host publication: Proceedings of International Conference on Visual Communications and Image Processing (VCIP'13)
Publisher: IEEE
ISBN (Print): 978-1-4799-0288-0
BFI conference series: Visual Communications and Image Processing (74e07863-12ba-4e91-9525-f28da41a8135)
Main Research Area: Technical/natural sciences
Conference: International Conference on Visual Communications and Image Processing (VCIP 2013), Kuching, Sarawak, Malaysia, 17/11/2013 - 17/11/2013
Electronic versions:
592_CR_20130815163149.pdf
DOIs:
10.1109/VCIP.2013.6706381
Source: dtu
Source-ID: u::10051
Publication: Research - peer-review › Article in proceedings – Annual report year: 2013

Game-Theoretic Rate-Distortion-Complexity Optimization of High Efficiency Video Coding

This paper presents an algorithm for rate-distortion-complexity optimization for the emerging High Efficiency Video Coding (HEVC) standard, whose high computational requirements urge the need for low-complexity optimization algorithms. Optimization approaches need to specify different complexity profiles in order to tailor the computational load to the different hardware and power-supply resources of devices. In this work, we focus on optimizing the quantization parameter and partition depth in HEVC via a game-theoretic approach. The proposed rate control strategy alone provides 0.2 dB improvement compared to the approach implemented in HEVC reference software, while rate-distortion-complexity optimization allows very accurate complexity control providing at the same time rate-distortion performance close to the optimal one.

General information

State: Published
Organisations: Department of Photonics Engineering, Coding and Visual Communication, Politecnico di Milano
Authors: Ukhanova, A. (Intern), Milani, S. (Ekstern), Forchhammer, S. (Intern)
Pages: 1995-1999
Publication date: 2013

Host publication information

Title of host publication: 2013 20th IEEE International Conference on Image Processing (ICIP)
Publisher: IEEE
BFI conference series: International Conference on Image Processing (cfb4ad6a-6240-4fc7-9edf-79b756c3edcf)
Main Research Area: Technical/natural sciences
Conference: 2013 IEEE International Conference on Image Processing (ICIP), Melbourne, Australia, 15/09/2013 - 15/09/2013
DOIs:
10.1109/ICIP.2013.6738411
Source: dtu
Source-ID: u::8598
Publication: Research - peer-review › Article in proceedings – Annual report year: 2013

Texture side information generation for distributed coding of video-plus-depth

We consider distributed video coding in a monoview video-plus-depth scenario, aiming at coding textures jointly with their corresponding depth stream. Distributed Video Coding (DVC) is a video coding paradigm in which the complexity is shifted from the encoder to the decoder. The Side Information (SI) generation is an important element of the decoder, since the SI is the estimation of the to-be-decoded frame. Depth maps enable the calculation of the distance of an object from the camera. The motion between depth frames and their corresponding texture frames (luminance and chrominance components) is strongly correlated, so the additional depth information may be used to generate more accurate SI for the texture stream, increasing the efficiency of the system. In this paper we propose various methods for accurate texture SI generation, comparing them with other state-of-the-art solutions. The proposed system achieves gains on the reference decoder up to 1.49 dB.

General information

State: Published
Organisations: Department of Photonics Engineering, Coding and Visual Communication, University of Copenhagen
Authors: Salmistraro, M. (Intern), Raket, L. L. (Forskerdatabase), Zamarin, M. (Intern), Ukhanova, A. (Intern), Forchhammer, S. (Intern)
Pages: 1699-1703
Publication date: 2013

Host publication information

Title of host publication: 2013 20th IEEE International Conference on Image Processing (ICIP)

Publisher: IEEE

ISBN (Print): 978-1-4799-2341-0

BFI conference series: International Conference on Image Processing (cfb4ad6a-6240-4fc7-9edf-79b756c3edcf)

Main Research Area: Technical/natural sciences

Conference: 2013 IEEE International Conference on Image Processing (ICIP), Melbourne, Australia, 15/09/2013 - 15/09/2013

DOIs:

10.1109/ICIP.2013.6738350

Source: dtu

Source-ID: n::oai:DTIC-ART:iel/434345146::37955

Publication: Research - peer-review > Article in proceedings – Annual report year: 2014

Objective assessment of the impact of frame rate on video quality

In this paper, we present a novel objective quality metric that takes the impact of frame rate into account. The proposed metric uses PSNR, frame rate and a content dependent parameter that can easily be obtained from spatial and temporal activity indices. The results have been validated on data from a subjective quality study, where the test subjects have been choosing the preferred path from the lowest quality to the best quality, at each step making a choice in favor of higher frame rate or lower distortion. A comparison with other relevant objective metrics shows that the proposed metric on average provides a more precise correlation with the subjective results.

General information

State: Published

Organisations: Department of Photonics Engineering, Coding and Visual Communication

Authors: Ukhanova, A. (Intern), Korhonen, J. (Intern), Forchhammer, S. (Intern)

Pages: 1513-1516

Publication date: 2012

Host publication information

Title of host publication: 2012 19th IEEE International Conference on Image Processing (ICIP),

Publisher: IEEE

ISBN (Print): 978-1-4673-2534-9

ISBN (Electronic): 978-1-4673-2532-5

Series: International Conference on Image Processing. Proceedings

ISSN: 1522-4880

BFI conference series: International Conference on Image Processing (cfb4ad6a-6240-4fc7-9edf-79b756c3edcf)

Main Research Area: Technical/natural sciences

Conference: 2012 IEEE International Conference on Image Processing, ICIP, Orlando, FL, United States, 30/09/2012 - 30/09/2012

Electronic versions:

Ukhanova_ICIP2012.pdf

DOIs:

10.1109/ICIP.2012.6467159

Bibliographical note

Copyright 2012 IEEE. Personal use of this material is permitted. However, permission to reprint/republish this material for advertising or promotional purposes or for creating new collective works for resale or redistribution to servers or lists, or to reuse any copyrighted component of this work in other works must be obtained from the IEEE.

Publication: Research - peer-review > Article in proceedings – Annual report year: 2012

Power consumption analysis of constant bit rate video transmission over 3G networks

This paper presents an analysis of the power consumption of video data transmission with constant bit rate over 3G mobile wireless networks. The work includes the description of the radio resource control transition state machine in 3G networks, followed by a detailed power consumption analysis and measurements of the radio link power consumption. Based on this description and analysis, we propose our power consumption model. The power model was evaluated on a smartphone Nokia N900, which follows 3GPP Release 5 and 6 supporting HSDPA/HSUPA data bearers. We also propose a method for parameter selection for the 3GPP transition state machine that allows to decrease power consumption on a mobile device taking signaling traffic, buffer size and latency restrictions into account. Furthermore, we discuss the gain in power consumption vs. PSNR for transmitted video and show the possibility of performing power consumption management based on the requirements for the video quality.

General information

State: Published

Organisations: Department of Photonics Engineering, Coding and Visual Communication, Tampere University of Technology, Aalto University

Authors: Ukhanova, A. (Intern), Belyaev, E. (Ekstern), Wang, L. (Ekstern), Forchhammer, S. (Intern)

Keywords: (3G, Video transmission, Constant bit rate, Power consumption modeling, Power saving)

Pages: 1695-1706

Publication date: 2012

Main Research Area: Technical/natural sciences

Publication information

Journal: Computer Communications

Volume: 35

Issue number: 14

ISSN (Print): 0140-3664

Ratings:

BFI (2015): BFI-level 1

Scopus rating (2015): 0.889 2.002

BFI (2014): BFI-level 1

Scopus rating (2014): 0.951 2.531

BFI (2013): BFI-level 1

Scopus rating (2013): 0.681 2.187

ISI indexed (2013): ISI indexed yes

BFI (2012): BFI-level 1

Scopus rating (2012): 0.676 2.139

ISI indexed (2012): ISI indexed yes

BFI (2011): BFI-level 1

Scopus rating (2011): 0.664 1.949

ISI indexed (2011): ISI indexed yes

BFI (2010): BFI-level 1

Scopus rating (2010): 0.602 1.781

BFI (2009): BFI-level 1

Scopus rating (2009): 0.576 1.438

BFI (2008): BFI-level 1

Scopus rating (2008): 0.535 1.167

Scopus rating (2007): 0.498 0.979

Scopus rating (2006): 0.54 1.103

Scopus rating (2005): 0.62 1.401

Scopus rating (2004): 0.696 1.481

Scopus rating (2003): 0.57 1.136

Scopus rating (2002): 0.497 0.967

Scopus rating (2001): 0.315 0.833

Scopus rating (2000): 0.474 0.625

Scopus rating (1999): 0.273 0.772

Original language: English

Electronic versions:

8C702d01.pdf

DOIs:

10.1016/j.comcom.2012.05.010

Publication: Research - peer-review › Journal article – Annual report year: 2012

Resource-Constrained Low-Complexity Video Coding for Wireless Transmission

Constrained resources like memory, power, bandwidth and delay requirements in many mobile systems pose limitations for video applications. Standard approaches for video compression and transmission do not always satisfy system requirements. In this thesis we have shown that it is possible to modify and optimize conventional algorithms in order to convert them into low-complexity solutions and satisfy system constraints.

We have studied low-complexity approaches for video compression without motion estimation. We have proposed scalable (progressive) solutions for video compression with low memory consumption based on image coding standards. Scalability aspects were studied for distributed video coding as well. We have compared temporal scalability for distributed and scalable video coding and provided recommendations for the choice of one of these solutions based on the system

requirements. Another comparison regarded power consumption for distributed video coding and H.264/AVC standard. We also proposed a scalable-to-lossless extension of transform domain Wyner-Ziv codec that allows bit savings compared to lossless coding by standard algorithms. Scalability aspects were also studied in perspective of video quality. We proposed a new metric for objective quality assessment that considers frame rate.

As many applications deal with wireless video transmission, we performed an analysis of compression and transmission systems with a focus on power-distortion trade-off. We proposed an approach for ratedistortion-complexity optimization of upcoming video compression standard HEVC. We also provided a new method allowing decrease of power consumption on mobile devices in 3G networks. Finally, we proposed low-delay and low-power approaches for video transmission over wireless personal area networks, including 60GHz fiber-wireless link.

General information

State: Published

Organisations: Department of Photonics Engineering, Coding and Visual Communication, Networks Technology and Service Platforms

Authors: Ukhanova, A. (Intern), Forchhammer, S. (Intern), Dittmann, L. (Intern)

Number of pages: 168

Publication date: 2012

Publication information

Place of publication: Kgs. Lyngby

Publisher: Technical University of Denmark

Original language: English

Main Research Area: Technical/natural sciences

Electronic versions:

PhD_thesis_Anna_Ukhanova_final_version_Feb_2012.pdf

Publication: Research › Ph.D. thesis – Annual report year: 2013

Extending JPEG-LS for low-complexity scalable video coding

JPEG-LS, the well-known international standard for lossless and near-lossless image compression, was originally designed for non-scalable applications. In this paper we propose a scalable modification of JPEG-LS and compare it with the leading image and video coding standards JPEG2000 and H.264/SVC intra for low-complexity constraints of some wireless video applications including graphics.

General information

State: Published

Organisations: Coding and Visual Communication, Department of Photonics Engineering, Saint-Petersburg State University of Aerospace Instrumentation

Authors: Ukhanova, A. (Intern), Sergeev, A. (Ekstern), Forchhammer, S. (Intern)

Keywords: (Wireless video transmission, JPEG2000, H.264/SVC, Scalable JPEG-LS)

Pages: 78701D

Publication date: 2011

Conference: Image Processing: Algorithms and Systems, San Francisco, CA, USA, 01/01/2011

Main Research Area: Technical/natural sciences

Publication information

Journal: Proceedings of the SPIE - The International Society for Optical Engineering

Volume: 7870

ISSN (Print): 0277-786X

Ratings:

BFI (2015): BFI-level 1

BFI (2014): BFI-level 1

BFI (2013): BFI-level 1

ISI indexed (2013): ISI indexed no

BFI (2012): BFI-level 1

ISI indexed (2012): ISI indexed no

BFI (2011): BFI-level 1

ISI indexed (2011): ISI indexed no

BFI (2010): BFI-level 1

BFI (2009): BFI-level 1

BFI (2008): BFI-level 1

Original language: English

Electronic versions:

6270FA68d01.pdf

DOIs:

10.1117/12.887416

Links:

http://spiedigitallibrary.org.globalproxy.cvt.dk/proceedings/resource/2/psisdg/7870/1/78701D_1

Bibliographical note

Copyright 2011 Society of Photo-Optical Instrumentation Engineers. One print or electronic copy may be made for personal use only. Systematic reproduction and distribution, duplication of any material in this paper for a fee or for commercial purposes, or modification of the content of the paper are prohibited.

Source: orbit

Source-ID: 275947

Publication: Research - peer-review › Conference article – Annual report year: 2011

Optimization of high-definition video coding and hybrid fiber-wireless transmission in the 60 GHz band

We demonstrate that, by jointly optimizing video coding and radio-over-fibre transmission, we extend the reach of 60-GHz wireless distribution of high-quality high-definition video satisfying low complexity and low delay constraints, while preserving superb video quality.

General information

State: Published

Organisations: Metro-Access and Short Range Systems, Department of Photonics Engineering, Coding and Visual Communication, Universidad Politecnica de Valencia

Authors: Lebedev, A. (Intern), Pham, T. T. (Intern), Beltrán, M. (Ekstern), Yu, X. (Intern), Ukhanova, A. (Intern), Deng, L. (Intern), Guerrero Gonzalez, N. (Intern), Llorente, R. (Ekstern), Tafur Monroy, I. (Intern), Forchhammer, S. (Intern)

Pages: We.10.P1.97

Publication date: 2011

Host publication information

Title of host publication: Proceedings of the European Conference on Optical Communication (ECOC) 2011

Publisher: Optical Society of America

Main Research Area: Technical/natural sciences

Conference: 37th European Conference and Exhibition on Optical Communication, Geneva, Switzerland, 18/09/2011 - 18/09/2011

Electronic versions:

We.10.P1.97.pdf

Links:

<http://www.ecoc2011.org/>

Bibliographical note

This paper was published by OSA and is made available as an electronic reprint with the permission of OSA. The paper can be found at the following URL on the OSA website: www.opticsinfobase.org/abstract.cfm?URI=ECOC-2011-We.10.P1.97. Systematic or multiple reproduction or distribution to multiple locations via electronic or other means is prohibited and is subject to penalties under law.

Source: orbit

Source-ID: 284374

Publication: Research - peer-review › Article in proceedings – Annual report year: 2011

Optimization of high-definition video coding and hybrid fiber-wireless transmission in the 60 GHz band

The paper addresses the problem of distribution of highdefinition video over fiber-wireless networks. The physical layer architecture with the low complexity envelope detection solution is investigated. We present both experimental studies and simulation of high quality high-definition compressed video transmission over 60 GHz fiberwireless link. Using advanced video coding we satisfy low complexity and low delay constraints, meanwhile preserving the superb video quality after significantly extended wireless distance. © 2011 Optical Society of America.

General information

State: Published

Organisations: Metro-Access and Short Range Systems, Department of Photonics Engineering, Coding and Visual Communication, Universidad Politecnica de Valencia

Authors: Lebedev, A. (Intern), Pham, T. T. (Intern), Beltrán, M. (Ekstern), Yu, X. (Intern), Ukhanova, A. (Intern), Llorente, R. (Ekstern), Tafur Monroy, I. (Intern), Forchhammer, S. (Intern)

Pages: B895-B904

Publication date: 2011

Main Research Area: Technical/natural sciences

Publication information

Journal: Optics Express

Volume: 19

Issue number: 26

ISSN (Print): 1094-4087

Ratings:

BFI (2015): BFI-level 2

Scopus rating (2015): 2.186 1.664

BFI (2014): BFI-level 2

Scopus rating (2014): 2.584 2.228

BFI (2013): BFI-level 2

Scopus rating (2013): 2.572 2.309

ISI indexed (2013): ISI indexed yes

BFI (2012): BFI-level 2

Scopus rating (2012): 2.823 2.221

ISI indexed (2012): ISI indexed yes

BFI (2011): BFI-level 2

Scopus rating (2011): 2.798 2.7

ISI indexed (2011): ISI indexed yes

BFI (2010): BFI-level 2

Scopus rating (2010): 3.209 2.516

BFI (2009): BFI-level 2

Scopus rating (2009): 2.949 2.755

BFI (2008): BFI-level 2

Scopus rating (2008): 3.559 2.473

Scopus rating (2007): 3.299 2.08

Scopus rating (2006): 3.387 2.349

Scopus rating (2005): 3.412 2.459

Scopus rating (2004): 2.944 2.595

Scopus rating (2003): 2.77 2.238

Scopus rating (2002): 1.63 1.656

Scopus rating (2001): 1.566 1.427

Scopus rating (2000): 1.347 0.745

Scopus rating (1999): 1.532 0.859

Original language: English

Electronic versions:

02B35d01.pdf

DOIs:

10.1364/OE.19.00B895

Bibliographical note

This paper was published in Optics Express and is made available as an electronic reprint with the permission of OSA.

The paper can be found at the following URL on the OSA website: <http://www.opticsinfobase.org/abstract.cfm?URI=oe-19-26-B895>. Systematic or multiple reproduction or distribution to multiple locations via electronic or other means is prohibited and is subject to penalties under law.

Source: orbit

Source-ID: 316381

Publication: Research - peer-review › Journal article – Annual report year: 2011

Power consumption analysis of constant bit rate data transmission over 3G mobile wireless networks

This paper presents the analysis of the power consumption of data transmission with constant bit rate over 3G mobile wireless networks. Our work includes the description of the transition state machine in 3G networks, followed by the detailed energy consumption analysis and measurement results of the radio link power consumption. Based on these description and analysis, we propose power consumption model. The power model was evaluated on the smartphone Nokia N900, which follows a 3GPP Release 5 and 6 supporting HSDPA/HSPA data bearers. Further we propose method of parameters selection for 3GPP transition state machine that allows to decrease power consumption on the mobile device.

General information

State: Published

Organisations: Coding and Visual Communication, Department of Photonics Engineering, Aalto University, Saint-Petersburg Institute for Informatics and Automation

Authors: Wang, L. (Ekstern), Ukhanova, A. (Intern), Belyaev, E. (Ekstern)

Pages: 217-223

Publication date: 2011

Host publication information

Title of host publication: 2011 11th International Conference on ITS Telecommunications (ITST)

Publisher: IEEE

ISBN (Print): 978-1-61284-668-2

Main Research Area: Technical/natural sciences

Conference: International Conference on ITS Telecommunications, Sankt-Petersburg, Russia, 01/01/2011

DOIs:

10.1109/ITST.2011.6060056

Links:

<http://www.itst2011.org/>

Source: orbit

Source-ID: 286686

Publication: Research - peer-review › Article in proceedings – Annual report year: 2011

Comparative analysis of equalization methods for SC-FDMA

In this paper we introduce comparative analysis for different types of equalization schemes, based on the minimum mean square error (MMSE) optimization. The following types of equalizers were compared: linear equalization, decision feedback equalization (DFE) and turbo equalization. Performance and complexity of these schemes were tested for Single Carrier Frequency Division Multiple Access (SC-FDMA) system with Single Input Single Output (SISO) antenna configuration. SC-FDMA is a common technique, which is used in the UTRA LTE Uplink, so the results of complexity and performance analysis could be applied to find the appropriate equalization algorithm to be used in the Uplink channel of the LTE – the famous standard in 4G telecommunications. Simulation results in the end in this paper show bit error ratio (BER) and modulation error ratio (MER) for compared schemes.

General information

State: Published

Organisations: Metro-Access and Short Range Systems, Department of Photonics Engineering, Coding and Visual Communication, Saint-Petersburg State University of Aerospace Instrumentation

Authors: Dogadaev, A. K. (Intern), Kozlov, A. (Ekstern), Ukhanova, A. (Intern)

Publication date: 2010

Host publication information

Title of host publication: Proceedings FRUCT

Main Research Area: Technical/natural sciences

Conference: 8th Conference of Finnish-Russian University Cooperation in Telecommunications, Lappeenranta, Finland, 09/11/2010 - 09/11/2010

Electronic versions:

5A0DCd01.pdf

eq_comparative_analysis.pdf

Links:

http://fruct.org/conf8/FRUCT8-Dogadaev_Comparative_Analysis_of_Equalization_Methods_for_SC-FDMA.pdf

<http://fruct.org/conference8>

Source: orbit

Source-ID: 270527

Publication: Research - peer-review › Article in proceedings – Annual report year: 2010

Encoder power consumption comparison of Distributed Video Codec and H.264/AVC in low-complexity mode

This paper presents a power consumption comparison of a novel approach to video compression based on distributed video coding (DVC) and widely used video compression based on H.264/AVC standard. We have used a low-complexity configuration for H.264/AVC codec. It is well-known that motion estimation (ME) and CABAC entropy coder consume much power so we eliminate ME from the codec and use CAVLC instead of CABAC. Some investigations show that low-complexity DVC outperforms other algorithms in terms of encoder side energy consumption. However, estimations of power consumption for H.264/AVC and DVC stated in this paper show that for current implementations of DVC these statements could be disputed from a power consumption/compression efficiency point of view when comparing to compression algorithms based on differential frame coding (with zero search radius for ME).

General information

State: Published

Organisations: Coding and Visual Communication, Department of Photonics Engineering

Authors: Ukhanova, A. (Intern), Belyaev, E. (Ekstern), Forchhammer, S. (Intern)

Publication date: 2010

Host publication information

Title of host publication: Proceedings SoftCOM

Main Research Area: Technical/natural sciences

Conference: International Conference on Software, Telecommunications and Computer Networks, Bol, Croatia, 01/01/2010

Links:

<http://marjan.fesb.hr/softCOM/2010/index.html>

Source: orbit

Source-ID: 270522

Publication: Research - peer-review › Article in proceedings – Annual report year: 2010

Low-complexity JPEG-based progressive video codec for wireless video transmission

This paper discusses the question of video codec enhancement for wireless video transmission of high definition video data taking into account constraints on memory and complexity. Starting from parameter adjustment for JPEG2000 compression algorithm used for wireless transmission and achieving the best possible results by tuning settings, this work proceeds to develop a low-complexity progressive codec based on JPEG, which is compared to the tuned JPEG2000. Comparison to H.264/SVC for this codec is also given. As the results show, our simple solution on low rates can compete with JPEG2000 and H.264/SVC for specific video content.

General information

State: Published

Organisations: Coding and Visual Communication, Department of Photonics Engineering

Authors: Ukhanova, A. (Intern), Forchhammer, S. (Intern)

Publication date: 2010

Host publication information

Title of host publication: Proceedings ICUMT

ISBN (Print): 978-1-4244-7284-0

Main Research Area: Technical/natural sciences

Conference: International Congress on Ultra Modern Telecommunications and Control Systems 2010, Moscow, Russian Federation, 18/10/2010 - 18/10/2010

Links:

<http://www.icumt.org>

Source: orbit

Source-ID: 268354

Publication: Research - peer-review › Article in proceedings – Annual report year: 2010

Low-latency video transmission over high-speed WPANs based on low-power video compression

This paper presents latency-constrained video transmission over high-speed wireless personal area networks (WPANs). Low-power video compression is proposed as an alternative to uncompressed video transmission. A video source rate control based on MINMAX quality criteria is introduced. Practical results for video encoder based on H.264/AVC standard are also given.

General information

State: Published

Organisations: Coding and Visual Communication, Department of Photonics Engineering, Intel Corporation, Saint-Petersburg State University of Aerospace Instrumentation

Authors: Belyaev, E. (Ekstern), Turlikov, A. (Ekstern), Ukhanova, A. (Intern)

Publication date: 2010

Host publication information

Title of host publication: proceedings WCNC

Publisher: IEEE

Main Research Area: Technical/natural sciences

Conference: Wireless Communications & Networking Conference, Sydney, Australia, 01/01/2010

Electronic versions:

Ann Ukhanova, WCNC, 2010.pdf

Bibliographical note

Copyright 2009 IEEE. Personal use of this material is permitted. However, permission to reprint/republish this material for advertising or promotional purposes or for creating new collective works for resale or redistribution to servers or lists, or to reuse any copyrighted component of this work in other works must be obtained from the IEEE.

Source: orbit

Source-ID: 261826

Publication: Research - peer-review › Article in proceedings – Annual report year: 2010

Maximizing entropy of image models for 2-D constrained coding

This paper considers estimating and maximizing the entropy of two-dimensional (2-D) fields with application to 2-D constrained coding. We consider Markov random fields (MRF), which have a non-causal description, and the special case of Pickard random fields (PRF). The PRF are 2-D causal finite context models, which define stationary probability distributions on finite rectangles and thus allow for calculation of the entropy. We consider two binary constraints and revisit the hard square constraint given by forbidding neighboring 1s and provide novel results for the constraint that no uniform 2×2 squares contains all 0s or all 1s. The maximum values of the entropy for the constraints are estimated and binary PRF satisfying the constraint are characterized and optimized w.r.t. the entropy. The maximum binary PRF entropy is 0.839 bits/symbol for the no uniform squares constraint. The entropy of the Markov random field defined by the 2-D constraint is estimated to be (upper bounded by) 0.8570 bits/symbol using the iterative technique of Belief Propagation on 2×2 finite lattices. Based on combinatorial bounding techniques the maximum entropy for the constraint was determined to be 0.848.

General information

State: Published

Organisations: Coding and Visual Communication, Department of Photonics Engineering

Authors: Forchhammer, S. (Intern), Danieli, M. (Intern), Burini, N. (Intern), Zamarin, M. (Intern), Ukhanova, A. (Intern)

Number of pages: 6

Publication date: 2010

Host publication information

Title of host publication: Proceedings WITMSE

Main Research Area: Technical/natural sciences

Conference: Workshop on Information Theoretic Methods in Science and Engineering, Tampere, Finland, 01/01/2010

Electronic versions:

witmse10Forchhammerfinalv2.pdf

Links:

http://sp.cs.tut.fi/WITMSE10/Proceedings/WITMSE2010_Papers/witmse10Forchhammerfinalv2.pdf

Source: orbit

Source-ID: 266587

Publication: Research - peer-review › Article in proceedings – Annual report year: 2010

Scalable-to-lossless transform domain distributed video coding

Distributed video coding (DVC) is a novel approach providing new features as low complexity encoding by mainly exploiting the source statistics at the decoder based on the availability of decoder side information. In this paper, scalable-to-lossless DVC is presented based on extending a lossy TransformDomain Wyner-Ziv (TDWZ) distributed video codec with feedback. The lossless coding is obtained by using a reversible integer DCT. Experimental results show that the performance of the proposed scalable-to-lossless TDWZ video codec can outperform alternatives based on the JPEG 2000 standard. The TDWZ codec provides frame by frame encoding. Comparing the lossless coding efficiency, the proposed scalable-to-lossless TDWZ video codec can save up to 5%-13% bits compared to JPEG LS and H.264 Intra frame lossless coding and do so as a scalable-to-lossless coding.

General information

State: Published

Organisations: Coding and Visual Communication, Department of Photonics Engineering

Authors: Huang, X. (Intern), Ukhanova, A. (Intern), Veselov, A. (Ekstern), Forchhammer, S. (Intern), Gilmudinov, M. (Ekstern)

Pages: 327-332

Publication date: 2010

Host publication information

Title of host publication: Proceedings 2010 IEEE International Workshop on Multimedia Signal Processing

Publisher: IEEE

ISBN (Electronic): 978-1-4244-8111-8

Main Research Area: Technical/natural sciences

Conference: 2010 IEEE International Workshop on Multimedia Signal Processing, Saint-Malo, France, 01/01/2010

DOIs:

10.1109/MMSP.2010.5662041

Source: orbit

Source-ID: 267750

Publication: Research - peer-review › Article in proceedings – Annual report year: 2010

Building Strategic Partnership between Industrial and Academic Research: Finnish-Russian University Cooperation in Telecommunications (FRUCT) program

General information

State: Published

Authors: Balandin, S. (Ekstern), Dudkov, A. (Ekstern), Ukhanova, A. (Intern)

Publication date: 2009

Event: Paper presented at AIS, Divnomorskoe, Russian Federation.

Main Research Area: Technical/natural sciences

Publication: Research - peer-review › Paper – Annual report year: 2009

MINMAX Rate control in near-lossless video encoders for real-time data transmission

General information

State: Published

Authors: Belyaev, E. (Ekstern), Dogadaev, A. (Ekstern), Ukhanova, A. (Intern)

Publication date: 2009

Event: Paper presented at XII International Symposium on Problems of Redundancy in Information and Control Systems, St. Petersburg, Russian Federation.

Main Research Area: Technical/natural sciences

Publication: Research - peer-review › Paper – Annual report year: 2009

Power saving control for the mobile DVB-H receivers based on H.264/SVC standard

This paper discusses the utilization of scalable extension of H.264/AVC standard in digital video broadcasting for handheld devices. In this area the problem of mobile receiver power consumption is critically important. This paper amplifies the well-known idea of the time-slicing and allows the receiver to control the trade-off between video quality and power saving in the receiver depending on the priorities.

General information

State: Published

Organisations: Saint-Petersburg State University of Aerospace Instrumentation

Authors: Belyaev, E. (Ekstern), Grinko, V. (Ekstern), Ukhanova, A. (Intern)

Publication date: 2009

Host publication information

Title of host publication: WTS 2009 Wireless Telecommunications Symposium

Publisher: IEEE

ISBN (Print): 978-1-4244-2588-4

ISBN (Electronic): 978-1-4244-2589-1

Main Research Area: Technical/natural sciences

Conference: WTS 2009 Wireless Telecommunications Symposium, Prague, Czech Republic, 22/04/2009 - 22/04/2009

DOIs:

10.1109/WTS.2009.5068980

Source: dtu

Source-ID: n::oai:DTIC-ART:iel/131656264::15384

Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2009

Temporal scalability comparison of the H.264/SVC and distributed video codec

The problem of the multimedia scalable video streaming is a current topic of interest. There exist many methods for scalable video coding. This paper is focused on the scalable extension of H.264/AVC (H.264/SVC) and distributed video coding (DVC). The paper presents an efficiency comparison of SVC and DVC having reduced encoder complexity. Moreover, temporal scalability is described for these two algorithms, and it is analyzed and compared.

General information

State: Published

Organisations: Coding and Visual Communication, Department of Photonics Engineering, Saint-Petersburg State University of Aerospace Instrumentation

Authors: Huang, X. (Intern), Ukhanova, A. (Intern), Belyaev, E. (Ekstern), Forchhammer, S. (Intern)
Pages: 1-6
Publication date: 2009

Host publication information

Title of host publication: Proceedings International Conference on Ultra Modern Telecommunications
Publisher: IEEE
ISBN (Print): 9781424439423
Main Research Area: Technical/natural sciences
Conference: International Conference on Ultra Modern Telecommunications 2009, Sct. Petersburg, Russian Federation, 12/10/2009 - 12/10/2009
Electronic versions:
Huang.pdf
DOIs:
10.1109/ICUMT.2009.5345360
Links:
<http://ieeexplore.ieee.org.globalproxy.cvt.dk/stamp/stamp.jsp?tp=&arnumber=5345360&isnumber=5345316>

Bibliographical note

Copyright 2009 IEEE. Personal use of this material is permitted. However, permission to reprint/republish this material for advertising or promotional purposes or for creating new collective works for resale or redistribution to servers or lists, or to reuse any copyrighted component of this work in other works must be obtained from the IEEE.
Source: orbit
Source-ID: 251375
Publication: Research - peer-review › Article in proceedings – Annual report year: 2009

You can see the results of your research immediately

General information

State: Published
Organisations: Coding and Visual Communication, Department of Photonics Engineering
Authors: Ukhanova, A. (Intern)
Number of pages: 267
Publication date: 2009

Host publication information

Title of host publication: Beyond optical horizons : today and tomorrow with photonics
Place of publication: Kgs. Lyngby
Publisher: DTU Fotonik
Edition: 1
ISBN (Print): 87-92062-34-2
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 255219
Publication: Communication › Book chapter – Annual report year: 2009

Adaptive power saving on the receiver side in digital video broadcasting systems based on progressive video codecs

General information

State: Published
Organisations: Saint-Petersburg State University of Aerospace Instrumentation
Authors: Belyaev, E. (Ekstern), Koski, T. (Ekstern), Paavola, J. (Ekstern), Turlikov, A. (Ekstern), Ukhanova, A. (Intern)
Publication date: 2008
Event: Paper presented at The 11th International Symposium on Wireless Personal Multimedia Communications, Lapland, Finland.
Main Research Area: Technical/natural sciences
Links:
<http://www.cwc oulu.fi/wpmc2008/>
Publication: Research - peer-review › Paper – Annual report year: 2008

Optimal segment size for transmission in Multi-hop system

In this paper two schemes of the ARQ are presented: end-to-end and multi-hop ARQ. For the second ARQ scheme the question of the additional segmentation in hops is considered.. For the multi-hop ARQ scheme it is shown how to choose the optimal segment size in the case of limited and unlimited buffer. Also considered how the delay influences the optimal

segment size.

General information

State: Published

Authors: Ukhanova, A. (Intern), Luo, J. (Ekstern), Turlikov, A. (Ekstern)

Number of pages: 6

Publication date: 2008

Host publication information

Title of host publication: International Conference on Telecommunications, 2008 ICT

Publisher: IEEE

ISBN (Print): 978-1-4244-2035-3

ISBN (Electronic): 978-1-4244-2036-0

Main Research Area: Technical/natural sciences

Workshop: International Workshop on Multiple Access Communications, St. Petersburg, Russian Federation, 01/01/2008

DOIs:

10.1109/ICTEL.2008.4652702

Source: dtu

Source-ID: n::oai:DTIC-ART:iel/95246269::15385

Publication: Research - peer-review › Article in proceedings – Annual report year: 2008

Rate-control algorithms testing by using video source model

In this paper the method of rate control algorithms testing by the use of video source model is suggested. The proposed method allows to significantly improve algorithms testing over the big test set.

General information

State: Published

Organisations: Saint-Petersburg State University of Aerospace Instrumentation

Authors: Belyaev, E. (Ekstern), Turlikov, A. (Ekstern), Ukhanova, A. (Intern)

Number of pages: 5

Publication date: 2008

Host publication information

Title of host publication: International Conference on Telecommunications, 2008 ICT

Publisher: IEEE

ISBN (Print): 978-1-4244-2035-3

ISBN (Electronic): 978-1-4244-2036-0

Main Research Area: Technical/natural sciences

Conference: 15th International Conference on Telecommunications, St. Petersburg, Russian Federation, 01/01/2008

DOIs:

10.1109/ICTEL.2008.4652660

Source: dtu

Source-ID: n::oai:DTIC-ART:compendex/132714307::15386

Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2008

Rate-distortion control in wavelet-based video compression systems with memory restriction

General information

State: Published

Authors: Belyaev, E. (Ekstern), Turlikov, A. (Ekstern), Ukhanova, A. (Intern)

Publication date: 2007

Event: Paper presented at XI International Symposium on Problems of Redundancy in Information and Control Systems, St. Petersburg, Russian Federation.

Main Research Area: Technical/natural sciences

Publication: Research - peer-review › Paper – Annual report year: 2007

System of activities analysis in the centres of electronic payments

General information

State: Published

Authors: Ukhanov, A. (Ekstern), Ukhanova, A. (Intern)

Publication date: 2007

Host publication information

Title of host publication: Proceedings of the forum

Volume: 2

Main Research Area: Technical/natural sciences

Conference: International forum "Information systems. Problems, perspectives, innovation approaches", St. Petersburg, Russian Federation, 02/07/2007 - 02/07/2007

Publication: Research - peer-review › Article in proceedings – Annual report year: 2007

Projects:

Distributed Video Coding for Communication Networks

Department of Photonics Engineering

Period: 01/09/2009 → 22/11/2012

Number of participants: 6

Phd Student:

Ukhanova, Ann (Intern)

Supervisor:

Dittmann, Lars (Intern)

Main Supervisor:

Forchhammer, Søren (Intern)

Examiner:

Larsen, Knud J. (Intern)

Callet, Patrick Le (Ekstern)

Faber, Eskil (Ekstern)

Financing sources

Source: Internal funding (public)

Name of research programme: Institut stipendie (DTU) Samf.

Project: PhD