Hindawi Publishing Corporation
International Journal of Digital Multimedia Broadcasting
Volume 2009, Article ID 368326, 2 pages
doi:10.1155/2009/368326

Editorial

Advances in Video Coding for Broadcast Applications

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Received 31 March 2009; Accepted 31 March 2009

The growing diffusion of new services, like mobile television and video communications, based on a variety of transmission platforms (3G, WiMax, DVB-S/T/H, DMB, DTMB, Internet, etc.), emphasizes the need of advanced video coding techniques able to meet the requirements of both the receiving devices and the transmission networks. In this context, scalable and layered coding techniques represent a promising solution when aimed at enlarging the set of potential devices capable of receiving video content. Video encoders' configuration must be tailored to the target devices and services, that range from high definition, for powerful high-performance home receivers, to video coding for mobile handheld devices. Encoder profiles and levels need to be tuned and properly configured to get the best tradeoff between resulting quality and data rate, in such a way as to address the specific requirements of the delivery infrastructure. As a consequence, it is possible to choose from the entire set of functionalities of the same video coding standard in order to provide the best performance for a specified service. Among the most recent video coding standards, the ITU-T H.264/AVC offers a wide set of configurations, that make it able to address several different services, ranging from video streaming, to DVB-T/H broadcasting, to videoconferencing over IP networks.

This special issue aims to present state-of-the-art research and developing activities contributing to all aspects of video coding solutions focused on broadcast applications. The Call-for-Papers for this special issue resulted in the excellent submissions from around the world in both quality and quantity. After two rounds of careful reviews from about fifty experts in related fields, five papers were selected to be included in this special issue covering major topics, from coding related issues to error resilience and protection and to statistical multiplexing, thus providing a comprehensive overview on the area.

The first paper entitled "New adaptive algorithms for GOP size control with return channel suppression in Wyner-Ziv video coding" by C. Yaacoub et al. presents a novel algorithm for adaptive GOP size control in distributed Wyner-Ziv video coding, where key frames are intra coded according to the H.264/AVC standard. In order to avoid the use of a feedback channel, which is generally missing in broadcasting applications, theoretical calculations are used to estimate the bit rate necessary for successful decoding of Wyner-Ziv frames. The proposed system is also able to automatically switch to H.264 intra coding mode in image regions where it outperforms Wyner-Ziv encoding, to improve the overall PSNR with respect to pure H.264 intra coding, and fixed-GOP Wyner-Ziv coding.

The second paper, entitled "Intra skip in inter frame coding of H.264/AVC" by H. Su, deals with a novel mathematical model to skip intra mode predictions in inter frames coding according to H.264/AVC. The model is basically built around a weighted-coefficient function used to set a proper threshold, which, in its turn, affects the skipping of intra partitions evaluation. The aim of the proposed algorithm

is to minimize the complexity of inter coding, by cutting down encoding time, while facing a very minor increase of the resulting bit rate, thus making H.264/AVC codecs more suitable to real time applications. Moreover, the proposed solution can be applied in conjunction with any proposed "fast" inter and intra methods relying on inter partition mode decision, motion search algorithms, and fast intra algorithms.

Moving from specific H.264/AVC coding issues to the problems related to broadcast video transmission, the third paper entitled "An adaptive systematic lossy error protection scheme for broadcast applications based on frequency filtering and unequal picture protection", by M. Ramon et al., discusses an adaptive systematic lossy error protection scheme in which the Wyner-Ziv stream is obtained by means of frequency filtering in the transform domain. Besides that, error resilience may vary adaptively, according to the characteristics of the compressed video. By applying the proposed solution, a graceful degradation of the reconstructed video quality may be obtained even in presence of increasing transmission errors, and the proposed scheme is shown to provide better performance than other solutions, such those based on coarser quantization.

Error resilience in the context of video streaming is the topic discussed by the fourth paper entitled "Adaptive error resilience for video streaming", by L. R. Siruvuri et al. It is well known that compressed video sequences may be strongly affected by channel errors, and suitable channel coding schemes may reduce the impact of errors on the quality of the decoded video. The paper suggests a solution to adapt the number of Reed-Solomon parity symbols used to protect a compressed video sequence against channel errors, in order to minimize the impact of the redundant bits on the available bandwidth. This paper spans the reference broadcasting scenario, by assuming the availability of a return channel through which feedbacks from the client are used to properly tune the amount of parity bits. As a matter of fact, the possibility of a return channel is already foreseen in some broadcasting systems, such as the Digital Video Broadcasting Return Channel Satellite, a possible scenario in which the proposed solution could find application.

The last paper included in this special issue, "Statistical time-frequency multiplexing of HD video traffic in DVB-T2" by M. Rezaei et al. presents a model for describing High Definition video traffic, which is used to evaluate the performance of statistical multiplexing of HD broadcast services over DVB-T2. New features introduced by DVB-T2 with respect to DVB-T, such as a two-dimensional multiplexing of broadcast services in time and frequency domains, and a time-frequency slicing transmission scheme, allow to increase the flexibility of service multiplexing, which may be of vital importance when dealing with HD video broadcasting. The model presented in the paper is able to simulate a wide range of synthetic video bit streams with practical and statistical metrics of interest; performance evaluation of DVB-T2 shows the possibility of getting improved performance in terms of bandwidth efficiency, end-to-end delay, and video quality for the broadcast system.

As we conclude this overview, we would like to express our sincere gratitude to all the reviewers for their timely and insightful comments on the submitted manuscripts, which made this special issue possible.

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EURASIP Journal on Wireless Communications and Networking

Special Issue on

Advances in Quality and Performance Assessment for Future Wireless Communication Services

Call for Papers

Wireless communication services are evolving rapidly in tandem with developments and vast growth of heterogeneous wireless access and network infrastructures and their potential. Many new, next-generation, and advanced future services are being conceived. New ideas and innovation in performance and QoS, and their assessment, are vital to the success of these developments. These should be open and transparent, with not only network-provider-driven but also service-provider-driven and especially user-driven, options on management and control to facilitate always best connected and served (ABC&S), in whatever way this is perceived by the different stake holders. To wireless communication services suppliers and users, alike the complexity and integrability of the immense, diverse, heterogeneous wireless networks' infrastructure should add real benefits and always appear as an attractive user-friendly wireless services enabler, as a wireless services performance enhancer and as a stimulant to wireless services innovation. Effecting the integration of services over a converged IP platform supported by this diverse and heterogeneous wireless infrastructure presents immense QoS and traffic engineering challenges. Within this context, a special issue is planned to address questions, advances, and innovations in quality and performance assessment in heterogeneous wireless service delivery.

Topics of interest include, but are not limited to:

- Performance evaluation and traffic modelling
- Performance assessments and techniques at system/flow level, packet level, and link level
- Multimedia and heterogeneous service integration-performance issues, tradeoffs, user-perceived QoS, and quality of experience
- Network planning; capacity; scaling; and dimensioning
- Performance assessment, management, control, and solutions: user-driven; service-provider-driven; network-provider-driven; subscriber-centric and consumer-centric business model dependency issues
- Wireless services in support of performance assessment, management, and control of multimedia service delivery
- Performance management and assessment in user-driven live-access network change and network-driven internetwork call handovers
- Subscriber-centric and consumer-centric business model dependency issues for performance management, control, and solutions
- Simulations and testbeds

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Manuscript Due	August 1, 2009
First Round of Reviews	November 1, 2009
Publication Date	February 1, 2010

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International Journal of Microwave Science and Technology

Special Issue on Power Amplifiers for Wireless Communications

Call for Papers

RF power amplifiers are key components in wireless devices, which have become ubiquitous in today's society. The increased demand for higher linearity, efficiency, and size reduction has generated a vast research effort that has defied the imagination of scientists and engineers alike and developed a multibillion dollar industry that keeps on growing every year.

The International Journal of Microwave Science and Technology, published by Hindawi Publishing Corporation, invites authors to participate in the Special Issue on Power Amplifiers for Wireless Communications by submitting original papers on the following topics not limited to those listed:

- High efficiency RF power amplifiers
- Linearization and memory effects
- Novel design techniques
- Integrated power amplifiers for wireless handsets
- Active device and behavioral modeling
- CMOS applications in RF power amplification
- Compound semiconductor technology (GaAs, GaN)
- Novel packaging techniques

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Manuscript Due	November 1, 2009
First Round of Reviews	February 1, 2010
Publication Date	May 1, 2010

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EURASIP Journal on Advances in Signal Processing

Special Issue on
Signal Processing in Advanced Nondestructive Materials Inspection

Call for Papers

Nondestructive testing (NDT) is a noninvasive technique widely used in industry to detect, size, and evaluate different types of defects in materials, and it plays an important role whenever integrity and safe operation of engineered components and structures are concerned. Efficient and reliable nondestructive evaluation techniques are necessary to ensure the safe operation of complex parts and construction in an industrial environment for assessing service life, acceptability, and risk, as well as for reducing or even eliminating human error, thus rendering the inspection process automated, more reliable, reproducible, and faster. Examples of widely used conventional nondestructive techniques are ultrasonics, radiography, computed tomography, infrared thermography, and electromagnetic-based techniques.

As nondestructive testing is not a direct measurement method, the nature and size of defects must be obtained through analysis of the signals obtained from inspection. Signal processing has provided powerful techniques to extract information on material characterization, size, defect detection, and so on. For instance, in the case of images, the major processing and analysis methods include image restoration and enhancement, morphological operators, wavelet transforms, image segmentation, as well as object and pattern recognition, facilitating extraction of special information from the original images, which would not, otherwise, be available. Additionally, 3D image processing can provide further information if an image sequence is available.

Nowadays, techniques of nondestructive testing have evolved greatly due to recent advances in microelectronics and signal processing and analysis. For example, many image processing and analysis techniques can now be readily applied at standard video rates using commercially available hardware, in particular, to methods that generate TV-type image sequences, such as real-time radiography, pulse-video thermography, ultrasonic-phased array, laser ultrasonics, and shearography.

The main objective of this special issue of "Signal processing in nondestructive materials inspection" is to promote a comprehensive forum for discussion on the recent advances in signal processing techniques applied to nondestructive material inspection.

Topics of interest include, but are not limited to:

- Signal processing and analysis in advanced NDT
- Image processing and analysis in advanced NDT
- Materials characterization using advanced NDT
- Defect detection and characterization using advanced NDT
- Pattern recognition and classification for advanced NDT
- 3D image reconstruction from advanced NDT data
- Applications of advanced NDT
- Algorithms development for signal processing and analysis in advanced NDT
- Software development for defect detection and characterization in NDT images

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Manuscript Due	January 1, 2010
First Round of Reviews	April 1, 2010
Publication Date	July 1, 2010

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