

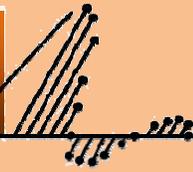
Call for Papers

# IEEE Thematic Meetings on Signal Processing

## Emerging Technologies for Video Compression

11 September 2011 • Brussels, Belgium

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Accepted papers will be published in the IEEE Journal on Selected Topics in Signal Processing.

IEEE-THEMES is a one-day event and will be held for the second time in 2011 in conjunction with **ICIP in Brussels, Belgium**. IEEE-THEMES is organized in a single track to cover intensively one focus area each meeting. THEMES 2011 will focus on **Emerging Technologies for Video Compression**.

**Manuscript submission due: 2 February 2011**

**First review completed: 6 April 2011**

**Revised manuscript due: 11 May 2011**

**Second review completed: 15 July 2011**

**Final manuscript due: 3 August 2011**

**Themes 2011: 11 September 2011**

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## Emerging Technologies for Video Compression

Video compression is a key enabler for all areas of multimedia communication and storage. Efficient and robust video compression is essential in technologies ranging from mobile phones, digital cameras and mobile TV through video broadcasting, DVD and IPTV, to professional applications in videoconferencing, surveillance, healthcare and military communications. All major video coding standards since H.261 was created in the late 80's have been based on incremental improvements to the hybrid motion-compensated block transform coding model. Also the technology considered in the new standardization project on high-efficiency video coding (HEVC) is somewhat a straightforward extension of its predecessor. While the approach has produced impressive rate-distortion improvements over the past two decades, the question arises whether more disruptive techniques can provide substantial gains. The demands on bandwidth, which will be dominated by video applications, are predicted to continue to increase. This increase will be linked to a continued expansion in the number of users, their requirements for on-demand services and the expectation of continual improvements in quality. Increased resolution, frame rate and dynamic range coupled with new features such as 3DTV and interactivity will compound this. Furthermore, the delivery challenges of emerging IP streaming applications, especially in the context of mobile applications push us toward quantum leaps in performance.

The current H.264/AVC standard is based on the picture-wise processing and waveform-based coding of video signals. It supports a wide range of encoder modes, which are typically optimized using mean-squared-error-based or related distortion measures. Unfortunately, these quality metrics do not always correlate with human perception and may be deceptive when used for mode selection. It is thus clear that new HVS-related metrics are needed, both for external evaluation of coded picture quality and as a basis for decision making within the compression process.

New frameworks for video compression are beginning to emerge, where prediction and signal representation may be based on a parametric or data-driven model of scene content. For example, a combination of waveform coding and texture replacement, where computer graphic models are employed to replace target textures at the decoder. These approaches may also be combined with higher order motion models for texture warping and mosaicing. In such cases, mean square error is no longer a valid objective function or measure of quality and emphasis must shift from rate distortion to rate-quality optimization, demanding new embedded quality metrics. The choice of texture analysis and synthesis technique, alongside meaningful quality metrics and the exploitation of long-term picture dependencies will be key if an effective and reliable system is to result.

Approaches such as those described above have the potential to create a new content-driven rate-quality optimization framework for video compression.

This special issue will present new technologies for improved video compression. Topics include but are not limited to:

- Quality assessment and artifact detection methods for perceptual video coding
- Rate quality optimization for next generation video compression
- Static and dynamic texture analysis, classification and synthesis for video compression
- Advanced motion models for video compression
- Methods for exploiting long term picture dependencies
- New sampling methods
- Exploitation of increased spatiotemporal resolutions and higher dynamic range
- Network-centric video coding, system solutions and proposed architectures

Submission procedures of the IEEE Journal on Selected Topics in Signal Processing (J-STSP) should be followed by submitting authors for IEEE-THEMES 2011. For more instructions on how to submit a manuscript to J-STSP please visit the [IEEE Journal of Selected Topics in Signal Processing](#) area of the [Signal Processing Society](#) web site.