

T4B: Future Video Coding – Coding Tools and Developments beyond HEVC (Room 206AB) [Top↑](#)

Speakers: Mathias Wien (RWTH Aachen University, Germany)

Abstract

While HEVC is the state-of-the-art video compression standard with profiles addressing virtually all video-related products of today, recent developments suggest significant performance improvements relative to this established technology. At the same time, the target application space evolves further towards higher picture resolution, higher dynamic range, fast motion capture, or previously unaddressed formats such as 360° video. The signal properties of this content open the door for different designs of established coding tools as well as the introduction of new algorithmic concepts which have not been applied in the context of video coding before. Specifically, the required ultra-high picture resolutions and the projection operations in the context of processing 360° video provide exciting options for new developments. This type of content further modifies the way of video consumption (enabling the use of head-mounted displays) as well as the methods of video content creation and production.

This tutorial will provide a comprehensive overview on recent developments and perspectives in the area of video coding. As a central element, the work performed in the Joint Video Exploration Team (JVET) of ITU-T SG16/Q6 (VCEG) and ISO/IEC JTC1 SC29WG11 (MPEG) is covered, as well as trends outside of the tracks of standardization bodies. The focus of the presentation is on algorithms, tools and concepts with potential for competitive future video compression technology. In this context, also the potential of methods related to perceptual models, synthesis of perceptual equivalent content, and deep learning based approaches will be discussed.

Speaker Bio:

Mathias Wien received the Diploma and Dr.-Ing. degrees from RWTH Aachen University, Germany, in 1997 and 2004, respectively. He currently works as a senior research scientist and head of administration, as well as lecturer, holding a permanent position at the Institute of Communication Engineering of RWTH Aachen University, Germany. His research interests include image and video processing, space-frequency adaptive and scalable video compression, and robust video transmission. Mathias has participated and contributed to ITU-T VCEG, ISO/IEC MPEG, the Joint Video Team, and the Joint Collaborative Team on Video Coding (JCT-VC) of VCEG and ISO/IEC MPEG in the standardization work towards AVC and HEVC. He has co-chaired and coordinated several AdHoc groups as well as tool- and core experiments. He has published the Springer textbook "High Efficiency Video Coding: Coding Tools and Specification", which fully covers Version 1 of HEVC. An extended edition covering the subsequent versions of HEVC is in preparation. Mathias is member of the IEEE Signal

Processing Society and the IEEE Circuits and Systems Society. At RWTH Aachen University, Mathias teaches the master level lecture "Video Coding: Algorithms and Specification", among other topics. The lecture covers the state of the art in video coding including HEVC.