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CODING OF MOVING PICTURES AND AUDIO**

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Title: Wavelet Video Coding – an Overview
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1 Introduction

Wavelet video coding is an emerging technology that could pave a way for a high adaptability of video. It provides the same functionalities as scalable video coding as presently developed within JVT, and its further potentials are being investigated within MPEG.

2 Motivation

The demand on higher mobility of video content across different platforms requires a solution that provides high degrees of scalability in spatial, temporal and quality domains. As the wavelet based coding technologies provide full embeddedness in these three domains, it is obviously as a strong candidate for achieving such requirements.

3 Overview of technology

Wavelet video coding provides a framework for highly scalable video coding as enabled by the multiresolution properties of wavelet transform. It is based on two key technologies - spatial wavelet transform and motion compensated temporal filtering (MCTF). It has been shown that different orders of these two decomposition strategies bring different advantages to the coding efficiency. Fig. 1. shows a general framework that includes wavelet transform in spatial and temporal direction. The main difference between possible wavelet based schemes comes from chosen number of pre- and post-2D spatial decompositions. Omitting pre-spatial decomposition introduces high compression gain and provides excellent quality for applications that do not need high-quality spatial scalability. On the other hand employment of pre-spatial transform contributes to enhanced lower resolution visual quality.

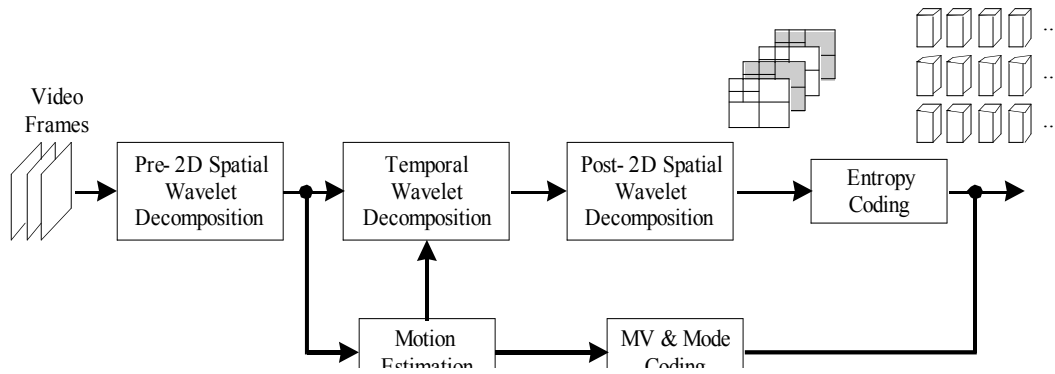


Fig. 1: General coding framework

4 Present Status of MPEG AhG Activity

The MPEG Adhoc Group on Wavelet Coding uses a common software to which 8 universities and 6 companies have contributed. Many tools have been included with the aim of increasing coding efficiency and final visual quality, keeping in mind that scalability is the main issue for this video codec. Improved results have been obtained, showing the good compression potential of the wavelet-based scalable video coding technology, where the overall compression performance however still lags behind the SVC standard presently under development. Further exploration activities will focus on the investigation of support for applications that need still higher degree of content adaptability, and compression of content with high and ultra-high resolution.