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CODING OF MOVING PICTURES AND AUDIO**

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Title: Comments on m3247 “Subband Dictionaries for Low Cost Matching Pursuits”
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Purpose: Information

Matching Pursuit is a video prediction error coding tool which is based on signal expansion using over-complete Gabor dictionary. It was originally proposed to MPEG committee by UCB and has been adopted to MPEG4 Version 2 Visual Working Draft since the Stockholm meeting in July 1997. In the contribution m3247 to the Tokyo meeting, Veeschouwer and Macq of UCL, Belgium propose using a Subband dictionary as an alternative to the Gabor dictionary. Their arguments are:

1. The Subband dictionary has roughly the same subjective and objective performances as the Gabor dictionary.
2. By using the Subband dictionary, the local matching pursuit atom search, when measured in algorithmic operation counts, can be sped up by a factor of 50 by exploiting the hierarchical subband structure and the simple Haar wavelet filter.

As the representatives from UCB, we are certainly glad to see more academic and industrial effort being put into improving the performance of Matching Pursuits. After reviewing m3247, we notice that the PSNR numbers for both the Gabor and Subband dictionaries quoted in the document are lower than those from the VM using Matching Pursuits by as much as 1.01 dB in luminance and 3.12 dB in chrominance (see m2877, for example). This is very likely due to the difference in the methods of coding the atom parameters. And hence it is unclear that the Subband dictionary can achieve the same level of performance as the Gabor dictionary. We encourage the UCL researchers to continue to improve their codec and compare the results with that of the Matching Pursuits codec described in the Visual VM.

The idea of using a different dictionary to achieve better speed performance is very constructive. As a matter of fact, the Speed Improved Matching Pursuits encoder from UCB is able to achieve 80 times faster performance by also using a different dictionary (m2377). Furthermore, it is quite plausible that visual material with very different characteristics than natural video can be compressed more efficiently when a customised dictionary is used. Thus, the concept of allowing the encoder to specify the dictionary set becomes very attractive. We

are currently working in this area and we encourage UCL and other interested organisations to participate and submit proposals in future meetings.