

A Parallel Vector Quantization Algorithm for SIMD Multiprocessor Systems ¹

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ABSTRACT

This poster proposes a parallel vector quantization (VQ) algorithm for an exhaustive search of codebooks on a Single-Instruction-Multiple-Data (SIMD) multiprocessor. The proposed parallel VQ algorithm can be integrated with the parallel wavelet-transform techniques for fast image compression. This algorithm has been implemented on the MasPar parallel computer to achieve favorable performance gains. Our results show that VQ can be efficiently parallelized on commercial SIMD machines to meet the real-time performance requirements of numerous applications. Note that although processors in the MP-1 machine are based on relatively old VLSI technology, the drastic speedup gained by parallelization of the computations is marked. Since our algorithm is applicable to any image size, it can be readily used on larger, faster SIMD multiprocessor systems for real-time processing of very large images.

Index Terms: Wavelet transform, vector quantization, parallel algorithm

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