SEGMENT−BASED MOTION ESTIMATION USING A BLOCK−BASED ENGINE (MonAmOR4)

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Abstract :

Motion estimation is a key function in scan rate conversion, advanced picture quality improvement, 2D−to−3D content conversion, and many other video processing steps. For hardware efficiency reasons, most motion estimation implementations are block−based. As object boundaries commonly do not coincide with block boundaries, artifacts may be visible at object boundaries using the block−based approach. Motion estimation for irregular shapes, such as image segments, can accurately track motion boundaries, but a straightforward translation of block−based motion estimation algorithms to segment−based ones leads to inefficient hardware implementations. Therefore, this paper proposes a modified segment−based motion estimation algorithm utilizing the efficiency of block−based processing. We demonstrates an efficient very large instruction word (VLIW) application−specific instruction−set processor (ASIP) implementation of this algorithm.

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