

面向硬件的分层 HEVC 运动估计算法

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摘要: 运动估计是 HEVC 中计算复杂度最高的部分之一. 为了提高 HEVC 压缩 UHD 视频时的编码效率, 本文采用在运动估计算法第一层结合中心全搜索和周边降采样搜索, 同时在第二层使用六边形快速搜索优化第一层搜索结果的方法. 将提出算法的代码加入到最新的 HEVC 仿真模型(HM 15.0)之后, 针对 UHD 视频序列的仿真测试显示提出算法在减少全搜索运动估计算法 97.8%的运算量的同时图像 BD-rate 只损失了 0.77%, 说明了提出的算法能够实现高效的编码效果.

关键词: 运动估计; 算法; HEVC; 面向硬件

Hardware-Oriented Hierarchical Motion

Estimation Algorithm for HEVC

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Abstract: Motion estimation is one of the most computational complex parts of HEVC. In order to improve the coding efficiency of HEVC compressing UHD video, this paper adopts the method of combining central full search and peripheral downsampling search into the first layer, and a hexagon fast search in the second layer to optimize the first layer search results. After describing the proposed algorithm in the latest HEVC software model (HM 15.0), the simulation test for the UHD video sequence shows that the proposed method can reduce the computational complexity of the full search motion estimation algorithm by 97.8%, while the BD-rate loss is only 0.77%, which shows that the proposed algorithm can achieve efficient encoding.

Key words: motion estimation; algorithm; HEVC; hardware-oriented

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