

学术探讨

## 基于边缘特征的H.264/AVC帧内模式选择算法

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**摘要** 为降低H.264帧内预测模式的计算复杂度,提出了一种率失真优化(RDO)准则下的基于边缘特征的快速帧内模式选择算法。该算法根据主要边缘强度(KES)等边缘方向特征,选择出与该特征相对应的模式子集进行RDO计算,大幅度降低了帧内预测的模式选择数;同时将亮度宏块和色度宏块分别优化以降低计算复杂度。仿真结果表明,与原H.264相比,所提出的算法在比特率略有增加和信噪比基本保持不变的条件下,大约减少75%的计算时间,大大降低了算法的计算复杂度;与PAN FENG等人提出的基于Sobel算子的边缘矢量检测算法相比,两者的比特率基本相同,但算法的平均峰值信噪比明显高于PAN的算法,编码时间也有明显降低,同时运算简单规则,更易于VLSI的实现。

**关键词** [H.264/AVC](#) [帧内预测](#) [率失真优化\(RDO\)](#) [主要边缘强度\(KES\)](#) [边缘特征](#) [VLSI](#)

分类号

## New fast intra mode decision algorithm based on edge feature for H.264/AVC

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### Abstract

To reduce the computational complexity of intra-prediction mode decision for H.264/AVC, a new fast Intra mode decision algorithm based on Rate Distortion Optimization (RDO) technology has been proposed in this paper. To reduce the number of intra-prediction mode, some candidate modes are selected based on the edge features or Key Edge Strength (KES) of the image, and then related RDO is calculated. Luma block and chroma block are separately optimized to reduce the computational complexity. Experimental results have shown that cost time of the proposed fast intra-prediction algorithm is down to about 25% of that of original algorithm cost with negligible PSNR degradation and slight bit-rate increase. Compared with the PAN's Sobel operator based edge detection algorithm, the proposed algorithm requires lower coding time and increases PSNR while keeping bit rate almost unchanged. Besides, the proposed algorithm is much easier to VLSI implementation.

**Key words** [H.264/AVC](#) [intra-prediction](#) [Rate Distortion Optimization \(RDO\)](#) [Key Edge Strength \(KES\)](#) [edge feature](#) [VLSI](#)

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