

研发、测试

## 一种基于积分投影的矢量量化器的设计与实现

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**摘要** 提出了一种积分投影和矢量量化(VQ)相结合的图像压缩算法,将图像的每一个 $4 \times 4$ 分块先进行积分投影,然后再与积分投影后的码书进行量化匹配,大大减少运算量和码书存储面积,而图像的质量只有轻微损失。实验结果表明,与普通VQ相比,本文算法的编码速度有大幅度的提高,而解码图像的峰值信噪比(PSNR)平均仅降低0.25%,对于某些单纯背景的图像,解码后的质量比普通VQ还会有所增加,此算法有很大的应用前景。设计了编码电路,并在FPGA上进行了验证。整个系统最高时钟频率可达78.12 MHz。

**关键词** [矢量量化](#) [积分投影](#) [编码电路](#)

分类号

## Design and implementation for integral projection Vector Quantizer

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### Abstract

An integral projection algorithm for Vector Quantization (VQ) is proposed in this paper, integral projection is used in every  $4 \times 4$  block firstly, and then carry on vector quantity with the integral codebook. The memory area of codebook and computation of encode can be reduced greatly while the quality of the picture only loses slightly. To compare with standard VQ algorithm, the result of experiment shows that the encode speed can be improved greatly while the ordinary Peer Signal-Noise Ratio (PSNR) only reduced 0.25%. Compared with standard VQ, the quality of the decoded images can be improved in some particular image, the application of this arithmetic will have very good foreground. The architecture of encode circuit is designed, and verified in FPGA. The operation rate of the whole system can achieve 78.12 MHz.

**Key words** [Vector Quantization \(VQ\)](#) [integral projection](#) [encode circuit](#)

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