研究简报

基于DCT的实值离散Gabor变换

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摘要
该文提出了一种基于离散余弦变换(DCT)的实值离散Gabor变换(RDGT)，不仅适用于临界抽样条件而且适用于过抽样条件，并证明了变换的完备性条件。由于这种变换仅涉及实值计算，并且可利用快速DCT，IDCT算法来加速运算，因此比传统复值离散Gabor变换在计算和实现方面更为简单，必将有效地提高非平稳信号与图像的分析、处理速度和效率。
关键词　离散余弦变换(DCT)　离散Gabor变换　Gabor变换系数
分类号　TN911.72

Real-valued Discrete Gabor Transform Based on DCT

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Abstract
A Real-valued Discrete Gabor Transform (RDGT) based on DCT for finite sequences is proposed in this paper, which can be applied to both the critical sampling condition and the over-sampling condition. And the biorthogonal relationship between the analysis window and synthesis window for the transform is also proved in this paper. Because the DCT-based RDGT only involves real operations and can utilize fast DCT and IDCT algorithms for fast computation, it is easier in computation and implementation by hardware or software compared to the traditional DFT-based complex-valued discrete Gabor transform. The proposed transform can be used to improve the speed and efficiency in analyzing and processing nonstational or time-varying signals.

Key words   DCT   Discrete Gabor transform   Coefficients of Gabor transform

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