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基于SHIRCT和减影及CDF(2,2)DWT混合变换的超光谱图像无损压缩算法

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摘要　提出了SHIRCT和减影混合变换去除谱间冗余、2D-CDF(2,2)DWT去除空间冗余，该变换完全由加法和移位完成，便于硬件实现。去冗余效果好于(1D+2D)CDF(2,2)DWT+改进的EBCOT算法进行编码。实验结果表明，无损压缩性能略好于(1D+2D)CDF(2,2)DWT+改进EBCOT，远好于JPEG LS、WinZip、ARJ、DPCM、文献\[1\]及NMST和MST。

关键词　信息处理技术　SHIRCT和减影混合变换　冗余　无损压缩　改进的EBCOT算法

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Lossless hyper-spectral image compression algorithm based on mixing transform of SHIRCT, subtraction and CDF(2, 2) DWT

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Abstract Integer reversible color transform (SHIRCT) and subtraction mixing transform to eliminate spectral redundancy was presented, meanwhile 2D-CDF(2, 2)DWT was used to eliminate spatial redundancy. This transform can be fully implemented by add and shift operations, therefore it is convenient for hardware realization. Its redundancy elimination effect is better than that of (1D+2D)CDF(2, 2)DWT. An improved EBCOT algorithm was applied for compression coding. Experiments show that in lossless image compression application the effect of the proposed method is slightly better than the effect acquired using (1D+2D)CDF(2, 2)DWT and improved EBCOT algorithm. It is much better than JPEG LS, WinZip, ARJ, DPCM, NMST and MST, and the method in the literature\[1\]

Key words　information processing　SHIRCT and subtraction mixing transform　redundancy　lossless image compression　improved EBCOT algorithm

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