ROBUST DCT−SVD DOMAIN IMAGE WATERMARKING FOR COPYRIGHT PROTECTION: EMBEDDING DATA IN ALL FREQUENCIES (ThuAmOR8)

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Abstract :

Both Discrete Cosine Transform (DCT) and Singular Value Decomposition (SVD) have been used as mathematical tools for embedding data into an image. In this paper, we present a new robust hybrid watermarking scheme based on DCT and SVD. After applying the DCT to the cover image, we map the DCT coefficients in a zig−zag order into four quadrants, and apply the SVD to each quadrant. These four quadrants represent frequency bands from the lowest to the highest. The singular values in each quadrant are then modified by the singular values of the DCT−transformed visual watermark. We assume that the size of the visual watermark is one quarter of the size of the cover image. We show that embedding data in lowest frequencies is resilient to one set of attacks while embedding data in highest frequencies is resilient to another set of attacks. We compare our hybrid algorithm with a pure SVD−based scheme.

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