

## Adaptive Blind Wavelet-Based Watermarking Technique Using Tree Mutual-Differences

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**Abstract:** An adaptive blind wavelet-based watermarking scheme using tree mutual differences (ABW-TMD) is proposed by exploiting mutual differences between grouped coefficients of so-called wavelet trees. The ABW-TMD encoder adaptively searches for the bit host difference in such a manner to minimize the embedding error. The proposed ABW-TMD scheme proves its superiority in resisting against various image processing attacks as well as in reducing the computational cost when compared to other schemes. For the same watermark bit length, a 35% increase in peak signal-to-noise ratio (PSNR) can be achieved over what is possible using an earlier method. Also, when fixing the PSNR of the watermarked image, the watermark bit length can be doubled with the ability to extract the watermark, even in the presence of high JPEG/JPEG2000 compression ratios