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(57) Abstract :
The combined integer and discrete wavelet transform (CIDWT) with Harris hawk's optimization (HHO) for based color image watermarking (ClW)with the usage of both integer wavelet transform (IWT) and discrete wavelet transform (DWT).- In addition, discrete cosine transform (DOT) also employed to .extract the low frequency coefficients, and the hybrid encryption (HE) performs on watermark image to encrypt the data securely before embedding it into cover image while CIDWTTis used to extract the features from cover RGB image. Further, the HHO is employed for extracting the enhanced features obtained from CIDWT and DCT. Then, it embeds the encrypted watermark image into the cover image, here after the proposed method is denoted as HE-based CIDWT with HHO. Finally, the watermarked image is obtained using inverse transforms of IWT, DWT, and DCT with postprocessing operations. The simulations carried out on standard test images discloses the superiority of proposed HE-based CIDWT with HHO as compared to state-of-art CIW approaches and even that of HE-based CIDWT without HHO in terms of peak signal-to-noise ratio (PSNR), structural similarity (SS1M) index, mean square error (MSE), normalized cross correlation (NCC) and unified averaged changed intensity (UACI) values.

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