Hybrid particle swarm optimization for robust digital image watermarking

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ABSTRACT
This paper presents an image watermarking algorithm for the optimization between robustness and transparency which is recently considered as one of the most challenging issues. The novelty is to associate the Hybrid Particle Swarm Optimization (HPSO), instead of a single optimization, as a model with singular value decomposition (SVD). To embed and extract the watermark, the singular values of the blocked host image are modified according to the watermark and scaling factors. A series of training patterns are constructed by employing between two images. Moreover, the work takes accomplishing maximum robustness and transparency into consideration. HPSO method is used to estimate the multiple parameters involved in the model. Simulation results demonstrated that the proposed scheme can effectively improve the quality of the watermarked image and resist common image manipulations such as adding noise, resizing compression, tempering, etc. and some geometric attacks.

KEYWORDS:
Watermarking, singular value decomposition (SVD), hybrid particle swarm optimization (HPSO).

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