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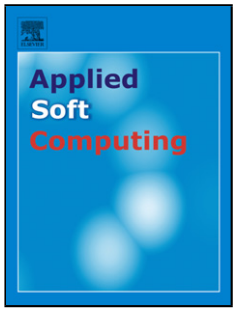

Title: Particle Swarm Optimizer with two differential mutation

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Particle swarm optimization is the most popular and well-known algorithm in the area of Swarm Intelligence. However, PSO is susceptible to premature convergence over the multi-modal fitness landscapes and local search ability of PSO is relatively weak. The proposed approach conquers the flaws of the PSO.

The main highlights of this paper can be summarized as follow:

(1) In this paper, we make use of the velocity update scheme with learning model. We study the optimization performance of PSOTD based on differential mutation and the modified velocity update scheme.

(2) Two differential mutation operators with different characteristics are adopted. One mutation operator has good global exploration ability and another mutation operator has good local exploitation ability. Furthermore, PSOTD adopts a new structure with two layers and two swarms. In PSOTD, one swarm has better exploration ability, and the other swarm has better exploitation ability.

(3) In order to enhance the exploitation ability of PSOTD, a dynamic adjustment scheme for the number of particle in two sub-swarms is proposed. This scheme is simple and effective.

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