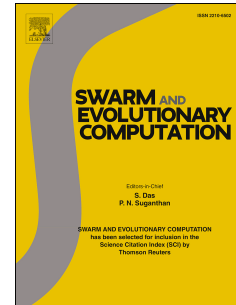


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Dynamic multi-swarm differential learning particle swarm optimizer

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Abstract

Because different optimization algorithms have different search behaviors and advantages, hybrid strategy is one of the main research directions to improve the performance of PSO. Inspired by this idea, a dynamic multi-swarm differential learning particle swarm optimizer (DMSDL-PSO) is proposed in this paper. We propose a novel method to merge the differential evolution operator into each sub-swarm of the DMSDL-PSO. Combining the exploration capability of the differential mutation and employing Quasi-Newton method as a local searcher to enhance the exploitation capability, DMSDL-PSO has a good exploration and exploitation capability. According to the characteristics of the DMSDL-PSO, three modified differential mutation operators are discussed. Differential mutation is adopted for the personal historically best particle. Because the velocity updating equation of the particles in PSO has some shortcomings, a modified velocity updating equation is adopted in DMSDL-PSO. In DMSDL-PSO, in which the particles are divided into several small and dynamic sub-swarms. The dynamic change of sub-swarms can promote the information exchange of the whole swarm. In order to test the performance of DMSDL-PSO, 41 bench-

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