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Particle Swarm Optimization Algorithm in Dynamic Environments: Adapting Inertia Weight and Clustering Particles

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ABSTRACT

In this paper, we propose a new particle swarm optimization algorithm for dynamic environments. The proposed algorithm adjusts inertia weight adaptively to accelerate convergence and utilizes a local search on best swarm to refine obtained responses. To improve the search performance, when the search areas of two swarms are overlapped, the worse swarm will be removed. Moreover, in order to quickly track the changes in the environment, When a changes is revealed in surrounding environment, it causes swarms to be divided into two main parts, the first one is the particles in which are spread up randomly in whole space and then will be clustered to regroup. In the second group, all particles in the swarms convert to quantum particles. Experimental results on different dynamic environments modeled by GDBG benchmark show that the proposed algorithm outperforms other PSO algorithms, for most of environments.

INDEX TERMS

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