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Solving Moving Peaks Problem Using Memetic Algorithm Based on Fuzzy Particle Swarm Optimization

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ABSTRACT

Many real-world problems are dynamic in nature like an optimization problem, So that the position and value of global optimum will be changing over time. Therefore, in the first step it is necessary to detection the changes in dynamic environment and then exploring for solutions for solving the problem of dynamic optimization. The moving peaks benchmark (MPB) function is one of the well-known functions in the optimization of dynamic environments, that simulation dynamic problems behavior like real-world problems. In this paper, a memetic algorithm based on fuzzy particle swarm optimization proposed for optimization in dynamic environments. Due to the shifted and changed peaks in dynamic mode, the main idea of the proposed method is that after identifying changes in environment, the algorithm can follow search ranges near to previous peaks with memetic approach. one thing that be important, how to design memetic approach in this paper with using a fuzzy particle swarm optimization algorithm. Proposed algorithm accomplished on various scenarios on the moving peaks benchmark and the simulation results demonstrate the improvement of the performance of algorithm compared with other well-known algorithms.

Keywords: Optimization, Dynamic Environments, Moving Peaks Benchmark, Memetic, Fuzzy Particle Swarm Optimization.