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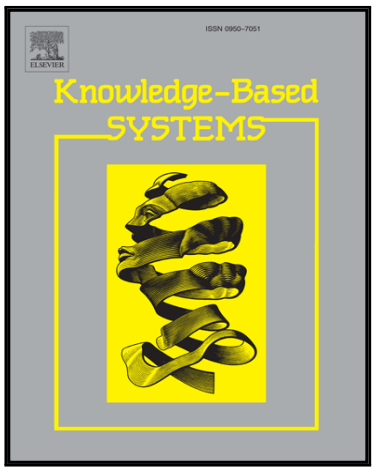

Optimization of Problems with Multiple Objectives using The Multi-Verse Optimization Algorithm

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Optimization of Problems with Multiple Objectives using The Multi-Verse Optimization Algorithm

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Abstract

This work proposes the multi-objective version of the recently proposed Multi-Verse Optimizer (MVO) called Multi-Objective Multi-Verse Optimizer (MOMVO). The same concepts of MVO are used for converging towards the best solutions in a multi-objective search space. For maintaining and improving the coverage of Pareto optimal solutions obtained, however, an archive with an updating mechanism is employed. To test the performance of MOMVO, 80 case studies are employed including 49 unconstrained multi-objective test functions, 10 constrained multi-objective test functions, and 21 engineering design multi-objective problems. The results are compared quantitatively and qualitatively with other algorithms using a variety of performance indicators, which show the merits of this new MOMVO algorithm in solving a wide range of problems with different characteristics.

Keywords: Multi-objective Optimization; Multi-verse Optimizer; Constrained multi-objective optimization; MVO; MOMVO

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