An improved multi-state particle swarm optimization for discrete combinatorial optimization problems

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ABSTRACT
The binary-based algorithms including the binary gravitational search algorithm (BGSA) were designed to solve discrete optimization problems. Many improvements of the binary-based algorithms have been reported. In this paper, a variant of GSA called multi-state gravitational search algorithm (MSGSA) for discrete optimization problems is proposed. The MSGSA concept is based on a simplified mechanism of transition between two states. The performance of the MSGSA is empirically compared to the original BGSA based on six sets of selected benchmarks instances of traveling salesman problem (TSP). The results are statistically analyzed and show that the MSGSA has performed consistently in solving the discrete optimization problems.

KEYWORDS
Discrete combinatorial optimization problem; Multi-state; Particle swarm optimization

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