

基于精英反向学习的阶段性变异杂草算法

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摘 要: 提出了基于精英反向学习的阶段性变异杂草算法 (Elite opposition-based learning multi-stage mutated invasive weed optimization, EOMMIWO). 该算法将正态分布的标准差初始值和终止值由固定设置转化为根据问题自适应产生; 在杂草进化过程中让精英个体反向学习, 提高了算法的勘探能力; 另外, 在算法进化的不同阶段对杂草实施不同变异, 增强个体交流, 提高算法的开发能力. 通过 8 个经典的 Benchmark 函数测试, 结果表明该算法提高了杂草算法的求解精度和收敛速度, 具有很强的鲁棒性.

关键词: 杂草算法; 自适应标准差; 精英反向学习; 阶段性变异

Elite opposition-based learning multi-stage mutated invasive

weed optimization algorithm

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Abstract: An elite opposition-based learning multi-stage mutated invasive weed optimization algorithm (EOMMIWO) was proposed. First, the algorithm adaptively generated the initial value and the ending value of the standard deviation of the normal distribution according to the search area of the problem; Second, the elite individuals opposition-based learned which improved the exploration ability; Finally, different mutations were adopted in different stages the algorithm, which enhanced the communication among the individuals and improves the ability in exploitation. The test and comparison results of several complex Benchmark functions show that the proposed algorithm not only improves the solution accuracy and convergence speed of IWO algorithm, but also strengthens robustness.

Key words: invasive weed optimization algorithm; adaptive standard deviation; elite opposition-based learning; multi-stage mutation

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