MOICA: A NOVEL MULTI-OBJECTIVE APPROACH BASED ON IMPERIALIST COMPETITIVE ALGORITHM

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ABSTRACT
A novel multi-objective evolutionary algorithm (MOEA) is developed based on Imperialist Competitive Algorithm (ICA), a newly introduced evolutionary algorithm (EA). Fast non-dominated sorting and the Sigma method are employed for ranking the solutions. The algorithm is tested on six well-known test functions each of them incorporate a particular feature that may cause difficulty to MOEAs. The numerical results indicate that MOICA shows significantly higher efficiency in terms of accuracy and maintaining a diverse population of solutions when compared to the existing salient MOEAs, namely fast elitism non-dominated sorting genetic algorithm (NSGA-II) and multi-objective particle swarm optimization (MOPSO). Considering the computational time, the proposed algorithm is slightly faster than MOPSO and significantly outperforms NSGA-II.

KEYWORD
Multi-objective Imperialist Competitive Algorithm, Multi-objective optimization, Pareto front.