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Imperialist Competitive Algorithm with Adaptive Colonies

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Index Terms

Imperialist Competitive Algorithm; Absorption Policy; Density Probabilistic Model

Abstract

The novel Imperialist Competitive Algorithm (ICA) that was recently introduced, is a population-based optimization algorithm. It is inspired by socio-political process of imperialism in the real world. In this paper, a new Imperialist Competitive Algorithm with Adaptive Colonies movement (ICAR) is proposed. In the proposed algorithm, for an emperors, the absorption policy changed dynamically to adapt the radius of colonies movement toward the center of colonies. This mechanism is easily stuck into a local optimum when solves high-dimensional multi-objective optimization problems. To overcome this shortcoming, we use probabilistic model that updates the radius of colonies movement. This mechanism, ICA exploration capability will enhance. Some famous unconstrained optimization problems are used to test the ICAR performance. Simulation results show this strategy can improve the performance of the ICA significantly.

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