A Novel Human-Based Meta-Heuristic Algorithm: Dragon Boat Optimization

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Abstract

Dragon Boat Racing, a popular aquatic folklore team sport, is traditionally held during the Dragon Boat Festival. Inspired by this event, we propose a novel human-based meta-heuristic algorithm called dragon boat optimization (DBO) in this paper. It models the unique behaviors of each crew member on the dragon boat during the race by introducing social psychology mechanisms (social loafing, social incentive). Throughout this process, the focus is on the interaction and collaboration among the crew members, as well as their decision-making in different situations. During each iteration, DBO implements different state updating strategies. By modelling the crew's behavior and adjusting the state updating strategies, DBO is able to maintain high-performance efficiency. We have tested the DBO algorithm with 29 mathematical optimization problems and 2 structural design problems. The experimental results demonstrate that DBO is competitive with state-of-the-art meta-heuristic algorithms as well as conventional methods.

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