

عنوان مقاله:

Woodpecker Mating Algorithm (WMA): a nature-inspired algorithm for solving optimization problems

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خلاصه مقاله:

Nature-inspired metaheuristic algorithms have been a topic of interest for researchers to solve optimization problems in engineering designs and real-world applications, due to their simplicity and flexibility. This paper presents a new nature-inspired search algorithm called Woodpecker Mating Algorithm (WMA) and applies it to challenging problems in structural optimization. The WMA is a population-based metaheuristic algorithm that mimics the mating behavior of woodpeckers. It was inspired by the drumming sound intensity. In WMA, the population of woodpeckers is divided into male and female groups. The female woodpeckers approach the male woodpeckers based on the intensity of their drum sound. An efficiency comparison was drawn between the WMA algorithm and other metaheuristic algorithms by employing ۱۹ benchmark functions (including unimodal, multimodal and composite functions). Moreover, the performance of WMA is compared with ۸ of the best meta-heuristic algorithms using ۱۳ high dimensional multimodal and unimodal benchmark functions. The assessments and statistical results indicate that the WMA algorithm offers promising results and is capable of outperforming the most recent and popular algorithms proposed in the literature in most of the employed benchmark functions. Moreover, a statistically significant difference was observed compared to the other assessed algorithms. The proposed algorithm produced significant results for a non-convex, inseparable, and scalable problems.

کلمات کلیدی:

Metaheuristic, Optimization, Woodpecker, Drumming, Sound intensity

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