

## عنوان مقاله:

New Functions for Mass Calculation in Gravitational Search Algorithm

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## نویسندگان:

Sepehr Ebrahimi Mood

Esmat Rashedi - Graduate university of advanced technology

Mohammad Masoud Javidi - Shahid Bahonar University of Kerman

## خلاصه مقاله:

Nowadays, optimization problems are large-scale and complicated, so heuristic optimization algorithms have become common for solving them. Gravitational Search Algorithm (GSA) is one of the heuristic algorithms for solving optimization problems inspired by Newton's laws of gravity and motion. Definition and calculation of masses in GSA have an impact on the performance of the algorithm. Defining appropriate functions for mass calculation improves the exploitation and exploration power of the algorithm and prevents the algorithm from getting trapped in local optima. In this paper, Sigma scaling and Boltzmann selection functions are examined for mass calculation in GSA. The proposed functions are evaluated on some standard test functions including unimodal functions and multimodal functions. The obtained results are compared with the standard GSA, genetic algorithm, particle swarm optimization algorithm, gravitational particle swarm algorithm and clustered-GSA. Experimental results show that the proposed method outperforms the state-of-the-art optimization algorithms, despite the simplicity of implementation.

## کلمات کلیدی:

Gravitational Search Algorithm, Heuristic Search Algorithm, Scaling Functions, Exploration and Exploitation, Mass Calculation

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