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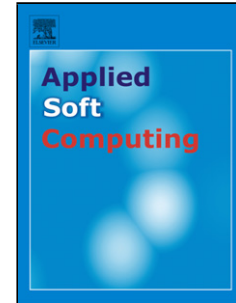
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A New Modification Approach on Bat Algorithm for Solving Optimization Problems

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Abstract

Optimization can be defined as an effort of generating solutions to a problem under bounded circumstances. Optimization methods have arisen from a desire to utilize existing resources in the best possible way. An important class of optimization methods is heuristic algorithms. Heuristic algorithms have generally been proposed by inspiration from the nature. For instance, Particle Swarm Optimization has been inspired by social behavior patterns of fish schooling or bird flocking. Bat Algorithm is a heuristic algorithm proposed by Yang in 2010 and has been inspired by a property, named as echolocation, which guides the bats' movements during their flight and hunting even in complete darkness. In this work, local and global search characteristics of Bat Algorithm have been enhanced through three different methods. To validate the performance of the Enhanced Bat Algorithm (EBA), standard test functions and constrained real-world problems have been employed. The results obtained by these test sets have proven EBA superior to the standard one. Furthermore, the method proposed in this study is compared with recently published studies in the literature on real-world problems and it is proven that this method is more effective than the studies belonging to other literature on this sort of problems.

Keywords: heuristics, bat algorithm, real-world problems, unconstrained problems

1. Introduction

Optimization is an effort of obtaining the optimal solution of a problem under given circumstances. The crucial task of optimization is to minimize wasted time or maximize desired benefit of a given engineering system. All systems that are to be optimized have an objective function and several decision variables that affect the function [1].

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