Enhanced stochastic fractal search algorithm with chaos

ABSTRACT

This study presents modifications to a metaheuristic algorithm inspired by natural phenomenon of growth with its performance assessment in comparison to its original predecessor algorithm on various standard classical benchmark functions. The modified algorithm aims to improve the Stochastic Fractal Search (SFS) algorithm in terms of convergence speed and fitness accuracy. The performance of SFS is affected by a constant that is used to decrease the size of Gaussian jumps and then encourage a more localized search for individuals. Five different chaotic maps have been selected in this study. The influence of these chaotic maps on convergence rate and solution accuracy is investigated using several classical standard benchmark functions. Overall results show that SFS algorithm with Gauss/Mouse map results in significant improvement in comparison to its original version.