

Springer Tracts in Nature-Inspired Computing

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Applications of Bat Algorithm and its Variants

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Contents

8 **Bat Algorithm with Applications to Signal, Speech, and Image Processing—A Review** 133
 K. Prajna and N. Manikanthababu

9 **Bat Algorithm Aided System to Extract Tumor in Flair/T2 Modality Brain MRI Slices** 155
 V. Sindhu, M. Singaravelan, J. Ramadevi, S. Vinitha, and S. Hemapriyaa

1 **A New Hybrid Binary Algorithm of Bat Algorithm and Differential Evolution for Feature Selection and Classification** 1
 Abdelmonem M. Ibrahim and Mohamed A. Tawhid

2 **Multi-objective Optimization of Engineering Design Problems Through Pareto-Based Bat Algorithm** 19
 Deniz Ustun, Serdar Carbas, and Abdurrahim Toktas

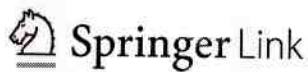
3 **A Study on the Bat Algorithm Technique to Evaluate the Skin Melanoma Images** 45
 Nilanjan Dey, V. Rajimikanth, Hong Lin, and Fuqian Shi

4 **Multi-thresholding with Kapur's Entropy—A Study Using Bat Algorithm with Different Search Operators** 61
 V. Rajimikanth, Nilanjan Dey, and S. Kavitha

5 **Application of Bat-Inspired Computing Algorithm and Its Variants in Search of Near-Optimal Golomb Rulers for WDM Systems: A Comparative Study** 79
 Shonak Bansal, Neena Gupta, and Arun K. Singh

6 **Levy Flight Opposition Embedded BAT Algorithm for Model Order Reduction** 103
 Shalini Shekhawat, Akash Saxena, Rajesh Kumar, and Vinay Pratap Singh

7 **Application of BAT Algorithm for Detecting Malignant Brain Tumors** 119
 Adit Kowal, Rishika Bharti, Mansi Pandya, Harshil Jhaveri, and Ramchandra Mangrulkar



Levy Flight Opposition Embedded BAT Algorithm for Model Order Reduction

Applications of Bat Algorithm and its Variants pp 103-118 | Cite as

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Chapter

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Abstract

The analytical study of large-scale linear time-invariant systems is a very tedious and complicated task in a category of real-life optimization problems. So, simplification procedures for these complex problems are needed. In the solution tactic of this complex problem, Model Order Reduction (MOR) is a novel concept providing a simpler model than the original one based on mathematical approximation. In literature, several meta-heuristics are employed to solve MOR problem. In the same line of order, this chapter presents a technique to solve MOR problem using modified BAT algorithm based on levy flight and opposition based learning. The concept of Levy flight random walk and opposition based learning (OBL) is embedded to BAT algorithm (BA) to avoid local optima trapping and to enhance the exploitation and exploration ability. To evaluate the performance of the proposed methodology, it is tested over three different MOR problems of different transfer functions. The numerical and statistical results confirmed the supremacy of the proposed variant in terms of stability of reduced order systems.

Keywords

Model order reduction Opposite based learning Levy flight distribution
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