

A Study of the Levy Distribution in Generation of BRKGA Random Keys Applied to Global Optimization

Mariana Moura

Universidade Federal de Pernambuco
mam7@cin.ufpe.br

Ricardo Silva

Universidade Federal de Pernambuco
rmas@cin.ufpe.br

ABSTRACT

Biased Random-Key Genetic Algorithm (BRKGA) is a variation of genetic algorithms that represents the solutions of a problem as real-key vectors defined by values randomly generated in the continuous interval $[0, 1)$ and uses a deterministic decoder to map these vectors into feasible solutions to the problem. In this work, is investigated the impact of the substitution of the uniform distribution, used in the generation of BRKGA random keys, by the use of the Levy distribution. This variation is inserted in two versions of the BRKGA present in the literature. The proposed versions were compared with the literature versions using a set of global optimization benchmark functions, present in several works of the research area. The algorithms are compared in terms of performance and quality of the solutions and the variations proposed in this work reach very promising results.

CCS CONCEPTS

• **Mathematics of computing** → **Continuous optimization; Distribution functions**; • **Theory of computation** → **Bio-inspired optimization**;

KEYWORDS

Levy Distribution, BRKGA, Global Optimization, Evolutionary Computing, Genetic Algorithms

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