

Shakespearean Soliloquy Optimization (SSO): A Structured Metaheuristic Framework for Global Optimization

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Abstract:

This paper proposes a structured framework for designing concept-inspired metaheuristic algorithms. Although many metaheuristics are derived from nature, society, art, or human behavior, their apparent novelty may be superficial if the mapping to mathematical search operators is not clearly defined, measurable, and reproducible.

In this paper, based on basic principles of stochastic search, population behavior, and standard benchmark testing, we do two things. First, we propose a general guideline that shows how a metaheuristic algorithm can be systematically built from a poem stanza or from the known traits of a famous person. Second, we introduce a new algorithm called Shakespearean Soliloquy Optimization (SSO). This method is inspired by dramatic elements in Shakespeare's works such as soliloquy (self-reflection), rhythmic movement, chorus interaction, and the conflict-resolution story arc.

We test SSO on a simple quadratic function $z = (x - 5)^2 + (y - 4)^2$ and compare its performance with PSO, ABC, and a continuous version of MBO. Then we evaluate it on five well-known benchmark functions: Sphere, Rosenbrock, Rastrigin, Ackley, and Griewank.

Keywords:

Metaheuristics, metaphor-to-algorithm mapping, Shakespearean soliloquy, swarm intelligence.