



AFSA-SL_nO Variants for Enhanced Global Optimization

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Abstract. Artificial fish swarm algorithm (AFSA) is a strategy which imitates the natural behavior of fish swarm in the real environment. Many improvements and modifications have been proposed on AFSA to improve its optimization performance. To date, nevertheless, the existing algorithms are still unable to achieve a satisfactory global optimum. This paper presents incorporation of circle updating position from Sea Lion Optimization (SL_nO) into AFSA to enhance the robustness and optimum value. Fifteen benchmarks function have been used to evaluate the performance of the proposed variants in comparison to the standard AFSA and SL_nO. The proposed variants show better result compared to the standard AFSA and SL_nO.

Keywords: Artificial Fish Swarm Algorithm (AFSA) · Sea Lion Optimization (SL_nO) · Benchmark function · Optimization · Swarm Intelligence

1 Introduction

Optimization plays an essential role in all aspects of living, either in the industry or academic in finding the best or optimal solution for a problem. Global search and optimization algorithm (GSOA) has been designed to solve optimization problems by finding the optimum solution for a given optimization problem [1]. Many algorithms are categorized under GSO, and one of them is an Artificial Fish Swarm Algorithm (AFSA).

It is a nature inspired method that mimics the social behavior of fish swarm. AFSA can search for the global optimum effectively and has an adaptive ability for search space. However, the AFSA individual behaviors are hunt for local optimal, and it may suffer from individual premature. Later, many variants and hybrid AFSA has been proposed by researchers to solve the problem. Weng Hooi et al. [1] has improved the adaptive parameters in term of visual and step to balance the contradiction between the exploration and exploitation processes. Besides that, other algorithms were hybrid with ASFA to enhance the performance of the global and local searching strategy in term of the best optimal solution such as cultural artificial fish swarm algorithm (CAFSA) [2]