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The Whale Optimization Algorithm and Its Implementation in MATLAB

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Abstract : Optimization is an important tool in making decisions and in analysing physical systems. In mathematical terms, an optimization problem is the problem of finding the best solution from among the set of all feasible solutions. The paper discusses the Whale Optimization Algorithm (WOA), and its applications in different fields. The algorithm is tested using MATLAB because of its unique and powerful features. The benchmark functions used in WOA algorithm are grouped as: unimodal (F1-F7), multimodal (F8-F13), and fixed-dimension multimodal (F14-F23). Out of these benchmark functions, we show the experimental results for F7, F11, and F19 for different number of iterations. The search space and objective space for the selected function are drawn, and finally, the best solution as well as the best optimal value of the objective function found by WOA is presented. The algorithmic results demonstrate that the WOA performs better than the state-of-the-art meta-heuristic and conventional algorithms.

Keywords : optimization, optimal value, objective function, optimization problems, meta-heuristic optimization algorithms, Whale Optimization Algorithm, implementation, MATLAB
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