
ABDELMONEM IBRHAIM, Mathematics Department, Faculty of Science, Al-Azhar University, Egypt
Binary whale optimization algorithm for feature selection

The principle of any approach for solving feature selection problem is to find a subset of the original features. Since finding a minimal subset of the features is an NP-hard problem, it is necessary to develop and propose practical and efficient heuristic algorithms. The whale optimization algorithm is a recently developed nature-inspired meta-heuristic optimization algorithm that imitates the hunting behavior of humpback whales to solve continuous optimization problems. In this paper, we propose a novel binary whale optimization algorithm (BWOA) to solve the feature selection problem. BWOA is especially desirable and appealing for feature selection problem whenever there is no heuristic information that can lead the search to the optimal minimal subset. Nonetheless, whales can find the best features as they hunt the prey. Rough set theory (RST) is one of the effective algorithms for feature selection. We use RST with BWOA as the first experiment, and in the second experiment, we use a wrapper approach with three different classifiers for feature selection. Also, we verify the performance and the effectiveness of the proposed algorithm by performing our experiments using 32 datasets from the UCI machine learning repository and comparing the proposed algorithm with some powerful existing algorithms in the literature. The results show that the proposed algorithm can provide an efficient tool to find a minimal subset of the original features.