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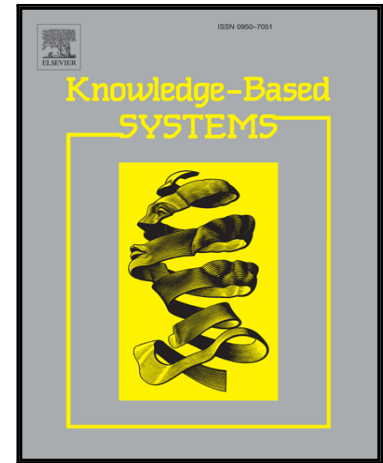
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# Evolutionary Population Dynamics and Grasshopper Optimization Approaches for Feature Selection Problems

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## Abstract

Searching for the optimal subset of features is known as a challenging problem in feature selection process. To deal with the difficulties involved in this problem, a robust and reliable optimization algorithm is required. In this paper, grasshopper optimization algorithm (GOA) is employed as a search strategy to design a wrapper-based feature selection method. The GOA is a recent population-based metaheuristic that mimics the swarming behaviors of grasshoppers. In this work, an efficient optimizer based on the simultaneous use of the GOA, selection operators, and Evolutionary Population Dynamics (EPD) is proposed in the form of four different strategies to mitigate the immature convergence and stagnation drawbacks of the conventional GOA. In the first two approaches, one of the top three agents and a randomly generated one are selected to reposition a solution from the worst half of the population. In the third and fourth approaches, to give a chance to the low fitness solutions in reforming the population, Roulette Wheel Selection (RWS) and

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