

Approaches Used In Adapting Metaheuristic Optimization Algorithms Developed For Continuous Problems to Discrete Problems

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Abstract

Many real-world problems such as determining the type and number of wind turbines, facility placement problems, job scheduling problems, are in the category of combinatorial optimization problems in terms of the type of decision variables. However, since many of the evolutionary optimization algorithms are developed for solving continuous optimization problems, they cannot be directly applied to optimization problems with discrete decision variables. Therefore, the continuous decision variable values generated by these metaheuristics need to be converted to binary values using some techniques. In other words, to apply such algorithms to discrete optimization problems, it is necessary to adapt the candidate solution vectors of the algorithms to discrete values and make changes in their working structures. In this study, firstly, adaptation methods that are frequently used in previous studies in transforming metaheuristic optimization algorithms designed for the solution of continuous optimization problems into discrete optimization algorithms are explained. Then, the popular location update strategies used in solving discrete optimization problems are explained. The presented work summarizes the process of adapting continuous optimization algorithms to solve combinatorial problems step by step.

Keywords: Metaheuristics, Combinatorial Optimization, Transfer Functions, LocationUpdate Strategies.