The Template Design Problem: A Perspective with Metaheuristics

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This paper deals with the template design problem, a hard constrained combinatorial problem with multiple applications. This problem is here formulated as a two-level combinatorial optimization problem whose solutions are integer matrices. In the higher level, a metaheuristic tackles the design of a collection of templates containing multiple instances of a set of components to be produced; in the lower level an integer linear programming solver is used to determine the optimal number of times each template has to be pressed in order to ful

ll production requirements as closely as possible. Three metaheuristics, i.e., hill climbing, tabu search, and genetic algorithms, have been considered in the higher level, and LPSolve, a simplex-based soft- ware for linear and integer programming problems, in the lower level. An empirical evaluation on three scenarios of increasing complexity has been performed, indicating the better performance of genetic algorithms. These results are comparable to those shown by sequential ILP models, and hint the possibility of hybrid approaches.