

A repair operator for global solutions of decomposable problems

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Abstract. This paper proposes a new repair operator to be used inside algorithms based on the concept of Search by Column Generation (SearchCol). This concept has revealed to be suitable to address problems represented by models that decompose the problem into several subproblems and in which a global solution can be obtained by combining solutions of the subproblems. SearchCol starts by solving the linear relaxation of the integer programming decomposition model using column generation. Metaheuristics are then used to search for the best global integer solution by combining subproblems' solutions. The new repair operator intends to fix the invalid solutions but ends up has a generator of new subproblems' solutions and allows to change the search space as the metaheuristic explores the search space. The success of the repair operator is verified in a SearchCol based evolutionary algorithm to solve a Bus Driver Rostering Problem.

Keywords. Search, Column generation, metaheuristics, repair operator.

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