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SMART: Solution Methods with Ants Running by Types

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Abstract : Ant algorithms are well-known metaheuristics which have been widely used since two decades. In most of the literature, an ant is a constructive heuristic able to build a solution from scratch. However, other types of ant algorithms have recently emerged: the discussion is thus not limited by the common framework of the constructive ant algorithms. Generally, at each generation of an ant algorithm, each ant builds a solution step by step by adding an element to it. Each choice is based on the greedy force (also called the visibility, the short term profit or the heuristic information) and the trail system (central memory which collects historical information of the search process). Usually, all the ants of the population have the same characteristics and behaviors. In contrast in this paper, a new type of ant metaheuristic is proposed, namely SMART (for Solution Methods with Ants Running by Types). It relies on the use of different population of ants, where each population has its own personality.

Keywords : ant algorithms, evolutionary procedures, metaheuristics, optimization, population-based methods
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