

Evaluation of choice functions to self-adaptive on constraint programming via the black hole algorithm

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In operation research and optimization area, Autonomous Search is a technique that provides the solver the auto-adaptive capability, during search process. This technique aims to improve performance in the exploration of search tree, updating the enumeration strategy online. This task is controlled by a choice function (CF) which decides, based on performance indicators given from the solver, how the strategy must be updated. The relevance of indicators is handled via black hole algorithm, inspired on natural phenomenon that occurs in outer space. If choice function exhibits a poor performance, the strategy is replacement and solver continue exploring the search tree under new enumeration strategy. In this paper, we present an evaluation of the impact and efficient using 16 different carefully constructed choice functions. We employ as test bed a set of well-known constrain satisfaction problems. Encouraging experimental results are obtained in order to show which using choice functions is highly efficient, if want to control the search process, online way. © 2016 IEEE.

Autonomous search

black hole algorithm

choice function

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Choice function

Constraint programming

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Satisfaction problem

Function evaluation