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An exact solution approach to the single-picker routing problem in warehouses with an arbitrary block layout.

This page contains material of the following publication:

Scholz, A. (2016):
An exact solution approach to the single-picker routing problem in warehouses with an
arbitrary block layout.
Working Paper No. 06/2016, Fakultät für Wirtschaftswissenschaft, Otto-von-Guericke Universität Magdeburg.

Abstract: The Single-Picker Routing Problem (SPRP) arises in warehouses when items have to be retrieved from their storage locations in order to satisfy a given demand. It deals with the determination of the sequence according to which the respective locations have to be visited. The storage locations in the warehouse are typically arranged in a specific way and constitute a so-called block layout. Using this structure, Scholz et al. (2016) proposed a model to the SPRP in a single-block layout whose size terms of number of variables and constraints) is independent of the number of locations to be visited. They briefly described how the model can be extended to deal with multiple blocks, but also stated that its size will drastically increase. In this paper, the extension of this formulation is considered and different scenarios are pointed out which can be used to significantly decrease th size of the model. By means of numerical experiments, it is demonstrated that the size of the formulation can be decreased by u to 60%, resulting in a reduction of computing time by up to 99.5%. Furthermore, it is shown that computing times do not increase with an increasing number of blocks, which is a major advantage of the model as no efficient solution approach to the SPRP is available able to deal with more than two blocks.

Typ	› Titel	Content
	› Appendix - Model Formulation	This file contains the appendix of the paper including the model formulation.
	› Instances SPRP multiple blocks	This file contains all data files for the Picker Routing Problem.

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