The integration of human factors in order picking planning problems
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The field of logistics faces tremendous challenges in the upcoming years due to, among others, the growing share of e-commerce transactions and a larger amount of product varieties, while customers expect fast and accurate delivery. Meeting these expectations in a cost-efficient way requires the optimal organisation of logistical processes, now more than ever. The harmonisation of warehouse characteristics and employees' qualities and traits offers an interesting, yet challenging opportunity. Order picking, i.e. retrieving products from storage locations and mainly performed manually, is by far the costliest activity within a warehouse, and is currently organised by means of several key planning problems. However, previous studies have highlighted that these planning problems barely take the affected human operators into account. Consequently, the main goal of this research is to develop models that are capable of capturing the true dynamics within a warehouse, without the utopic abstraction of human operators. The PhD project provides innovative tools that can be used by practitioners and academics to enhance logistic models and make them even more realistic. Additionally, the research contributes to the operations management community in general by presenting innovative algorithms that contribute to the efficient problem-solving of similar challenges in related research domains.