

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
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Efficient Container Ship Stowage Planning

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Abstract:

Cost-efficient container vessel stowage plans have become a priority for the shipping industry. In spite of the advances in technology, stowage plans are for the most part still produced manually. Stowage planning is NP-hard and is a challenging optimization problem in practice. We propose a new 2-phase approach that generates near-optimal stowage plans and fulfills industrial time and quality requirements. Our approach combines an integer programming model for assigning groups of containers to storage areas of the vessel over multiple ports, and a constraint programming and constraint-based local search procedure for stowing individual containers. To the best of the author's knowledge, this is the first work that presents a scalable mathematical model of overstowage for master planning. Moreover, we conduct the first extensive experimental evaluation based on a large set of industrial problem instances.

Host: Marco Chiarandini