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A 15 Minute-Based Approach for Berth Allocation and Quay Crane Assignment

Authors : Hoi-Lam Ma, Sai-Ho Chung

Abstract : In traditional integrated berth allocation with quay crane assignment models, time dimension is usually assumed in hourly based. However, nowadays, transshipment becomes the main business to many container terminals, especially in Southeast Asia (e.g. Hong Kong and Singapore). In these terminals, vessel arrivals are usually very frequent with small handling volume and very short staying time. Therefore, the traditional hourly-based modeling approach may cause significant berth and quay crane idling, and consequently cannot meet their practical needs. In this connection, a 15-minute-based modeling approach is requested by industrial practitioners. Accordingly, a Three-level Genetic Algorithm (3LGA) with Quay Crane (QC) shifting heuristics is designed to fulfill the research gap. The objective function here is to minimize the total service time. Preliminary numerical results show that the proposed 15-minute-based approach can reduce the berth and QC idling significantly.

Keywords : transshipment, integrated berth allocation, variable-in-time quay crane assignment, quay crane assignment
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