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A Novel Integration of Berth Allocation, Quay Cranes and Trucks Scheduling Problems in Container Terminals

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Abstract : As maritime container transport is developing fast, the need arises for efficient operations at container terminals. One of the most important determinants of container handling efficiency is the productivity of quay cranes and internal transportation vehicles, which are responsible transporting of containers for unloading and loading operations for container vessels. For this reason, this paper presents an integrated mathematical model formulation for discrete berths with quay cranes and internal transportations vehicles. The problems have received increasing attention in the literature and the present paper deals with the integration of these interrelated problems. A new mixed integer linear formulation is developed for the Berth Allocation Problem (BAP), Quay Crane Assignment and Scheduling Problem (QCASP) and Internal Transportation Scheduling (ITS), which accounts for cranes and trucks positioning conditions.

Keywords : discrete berths, container terminal, truck scheduling, dynamic vessel arrival
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