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Florida Atlantic University

College of Engineering and Computer Science

Berth Scheduling in Container Terminals: A Pro-Active Approach to Address Uncertainties in Arrival and Handling Times

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Container terminals have very complex and dynamic operations. Effective and efficient berth schedules are essential for profitable and sustainable operations. This paper studies berth scheduling under uncertainties in arrival and handling times. Port operators usually face challenges in the development of berth schedules. This paper presents a model formulation of discrete berth space that accounts for uncertainty in arrival and handling times. The problem is reformulated as a bi-objective bi-level optimization berth scheduling problem. A solution approach is presented using evolutionary algorithms and heuristics. The objective of the formulation is to provide a robust berth schedule by minimizing the average and range of the total service times for all vessels served at the terminal. Simulation is utilized to evaluate the proposed berth scheduling policy and compare it to two first-come-first-served policies.

