

A hybrid genetic-heuristic algorithm for scheduling of automated guided vehicles and quay cranes in automated container terminals

ABSTRACT

Containers have been used in past decades increasingly as one of the most important transportation tools. Containers have revolutionized cargo shipping and thus changed the world trade systematically. Container terminals as the transshipment facility play a valuable role in performance of this transportation system. Improvement of this facility has been widely considered in literatures. Automated container terminals (ACTs) have been introduced to pursue this purpose. In ACTs various transport vehicles are automated and integrated to each other. Automated guided vehicles (AGVs) are used in ACTs to handle containers between quay cranes and storage yards. Usually scheduling of the AGVs is known as the key factor to improve the performance of ACTs. This paper proposed a heuristic algorithm to schedule the AGVs concurrently with quay cranes. A genetic algorithm is proposed to optimize the simultaneous scheduling of AGVs and QCs. The results showed that proposed genetic algorithm can be used in practical implications while its running time is reasonably low.

Keyword: Automated guided vehicle; Quay cranes; Automated container terminal; Genetic algorithm