

短文

堆场集装箱翻箱的PCNN优化控制算法

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摘要

集装箱的堆存状态与理想发箱顺序很难保持一致, 翻箱操作是不可避免的. 为降低堆场的翻箱率, 提高作业效率, 在获得集装箱的取箱顺序前提下, 将每取一个集装箱所产生的可能状态视为一个状态结点, 所需的翻箱次数加一个基数作为状态结点间的连接权, 把翻箱优化问题转化为最短路径求解问题. 脉冲耦合神经网络(Pulse-coupled neural network, PCNN)具有独特的自动波并行传播的特性, 适用于求解大规模实时问题, 能一次求出源点到其他所有目标点的最短路径, 从而获得最优的翻箱方案. 其所需的计算量仅正比于最短路径的长度, 与路径图的复杂程度及路径图中的通路总数无关. 这为建立集装箱的智能控制系统奠定了坚实的理论基础.

关键词 [翻箱](#) [最短路径](#) [堆场](#) [智能控制](#) [脉冲耦合神经网络](#)

分类号

An Optimization Control Algorithm for Containers Relocation Based on PCNN Model

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Abstract

The stockpiling state of containers is usually not in the ideal order of the containers to be sent, so relocation of the containers is inevitable. In order to reduce the relocation frequency in the container yards, improve operational efficiency, on the condition that the order of container withdrawal is required, the paper regards every possible state that may be generated when a container is being withdrawn as a node, and takes the number of relocations plus a base as the connection weight of the node. Then, the optimization problem for container relocation is converted into the shortest-path solution problem. The paper brings forward a new approach to find the shortest path based on pulse-coupled neural network, which can be used to solve large-scale practical problem. We can easily work out the shortest path from a source to all other target points, therefore we have the best relocation program. The algorithm lays a solid theoretical basis for the container intelligent control system.

Key words [Containers relocation](#) [shortest-path](#) [container yard](#) [intelligent control](#) [pulse-coupled neural network \(PCNN\)](#)

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