

论文

QUEUEING NETWORK MODELING AND ANALYSIS IN THE DESIGN AND EVALUATION OF SEAPORT SYSTEMS

CHAO Xiuli(1), GU Jifa(2), HU Pingxian(3)

(1)Department of Industrial and Manufacturing Engineering, New Jersey Institute of Technology, Newark, NJ 07102, USA;(2)Institute of Systems Science, Academia Sinica, Beijing 100080, China;(3) Water Transportation Institute, The Ministry of Communications, Beijing 100088, China

收稿日期 修回日期 网络版发布日期 接受日期

摘要 In this paper we apply networks of queues in the design and analysis of a seaport system. There are two types of ports, the deep water port and shallow waterport. The steamships arrive via the Pacific ocean according to a random process, and can only enter the deep water port (due to the size of the ships). The finite capacity of the port, often results in long delays which is undesirable. To reduce this congestion problem, ports authorities are considering constructing a platform (or dock) in a deepwater area on which some steamships can be first downloaded, and then the goods on the platform are delivered and downloaded on the shallow water port by many small-size boats. This system is modeled as a network of queues with finite buffers and blocking. We develop approximation methodology for analyzing queue delays, and apply it, in the design and optimization of the port systems. The algorithm is proved to be efficient, and its effectiveness is shown by both numerical results and simulation analysis.

关键词 [Port, system, networks of queues, blocki](#)

分类号

QUEUEING NETWORK MODELING AND ANALYSIS IN THE DESIGN AND EVALUATION OF SEAPORT SYSTEMS

CHAO Xiuli(1), GU Jifa(2), HU Pingxian(3)

(1)Department of Industrial and Manufacturing Engineering, New Jersey Institute of Technology, Newark, NJ 07102, USA;(2)Institute of Systems Science, Academia Sinica, Beijing 100080, China;(3) Water Transportation Institute, The Ministry of Communications, Beijing 100088, China

Abstract In this paper we apply networks of queues in the design and analysis of a seaport system. There are two types of ports, the deep water port and shallow waterport. The steamships arrive via the Pacific ocean according to a random process, and can only enter the deep water port (due to the size of the ships). The finite capacity of the port, often results in long delays which is undesirable. To reduce this congestion problem, ports authorities are considering constructing a platform (or dock) in a deepwater area on which some steamships can be first downloaded, and then the goods on the platform are delivered and downloaded on the shallow water port by many small-size boats. This system is modeled as a network of queues with finite buffers and blocking. We develop approximation methodology for analyzing queue delays, and apply it, in the design and optimization of the port systems. The algorithm is proved to be efficient, and its effectiveness is shown by both numerical results and simulation analysis.

Key words [Port](#) [system](#) [networks of queues](#) [blocking](#) [approximation analysis](#) [design and optimization](#)

DOI:

通讯作者

扩展功能

本文信息

- ▶ [Supporting info](#)
- ▶ [PDF\(0KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [参考文献](#)

服务与反馈

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中包含“Port, system, networks of queues, blocki”的相关文章](#)

▶ 本文作者相关文章

- [CHAO Xiuli](#)
- [GU Jifa](#)
- [HU Pingxian](#)