

工程与应用

基于贝叶斯网络的航班延误波及研究

刘玉洁^{1,2}, 何丕廉¹, 刘春波², 曹卫东²

1.天津大学 计算机科学与技术学院, 天津 300072

2.中国民航大学 计算机学院, 天津 300300

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摘要 在民航业内, 航班延误波及问题一直是影响航班延误的一个主要因素。基于贝叶斯网络(BN), 讨论了在繁忙的枢纽机场, 其航班延误的波及问题。在实验中使用的数据, 皆来自国内某大型航空公司的真实记录。通过建立延误波及模型和贝叶斯网络模型, 探讨了相关航班中, 进港延误和航班取消对离港延误的影响。学习的结果显示了进港延误(Arrival-delay)对离港延误(Departure-Delay)的波及现象的存在; 以及波及现象在不同情况下的程度不同; 相应的可采取的应对方式亦不相同。其中航班取消是一种釜底抽薪的应对方法, 可以在一定程度上削弱上述条件下的延误波及, 其削弱程度与航班取消的架次有关。基于该研究可以在机场发生大规模延误时, 提供一个基本的参考。

关键词 [贝叶斯网络](#) [延误波及](#) [进港延误](#) [离港延误](#) [航班取消](#)

分类号

Flight delay propagation research based on Bayesian net

LIU Yu-jie^{1,2}, HE Pi-lian¹, LIU Chun-bo², CAO Wei-dong²

1.College of Computer Science and Technology, Tianjin University, Tianjin 300072, China

2.College of Computer Science and Technology, Civil Aviation University of China, Tianjin 300300, China

Abstract

In the industry of civil aviation, delay propagation of flight always is a main factor that impacts the flight's delay. This paper discusses the delay propagation problem in busy hub-airport. All the data used in the experiments is come from real records of one large domestic airlines. Through producing the model of delay propagation and modeling the Bayesian Net, the impact of arrival-delay on departure-delay between related flights is discussed. The outcomes of learned Bayesian net show that the existence of propagation phenomenon from arrival-delay impacts onto departure-delay; the degrees under varied circumstance are different; and the according coping methods are different. Cancellation of flights is a drastic remedy of those coping methods. It can weaken the delay propagation to some extent. The weakened degree is related to the number of flights cancelled. A preliminary reference can be made based on this research for airports when there is large scale delays of flights happened.

Key words [Bayesian net](#) [delay propagation](#) [arrival-delay](#) [departure-delay](#) [flight cancellation](#)

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通讯作者 刘玉洁 tjliuyujie@msn.com

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