

國立高雄第一科技大學

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碩士論文

最佳化機門指派
以高雄國際機場爲例

研 究 生：陳永鴻

指導教授：喻奉天 博士

黃山瑋 博士

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OPTIMIZING GATE ASSIGNMENTS
CASE STUDY OF KAOHSIUNG INTERNATIONAL AIRPORT

研 究 生：陳永鴻 Yung-Hung Chen
指 導 教 授：喻奉天 Feng-Tian Yu
黃山琿 Shan-Huen Huang

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摘要

機場是一個國家的重要設施，台灣每年出國人數持續增加，所以機場運作的優劣會直接影響旅客。機門指派作業關係到整體機場系統的運作，其角色是相當重要的。當機場的指派作業順利時才可以讓所有入境、出境或轉機的旅客有較好的滿意度，也可以減少航空公司許多成本（行李、地勤成本等等），以及讓每位旅客皆得到較優質的飛航服務。

航空站系統主要的設施包括跑道、滑行道、停機坪、國際航站大廈、國內航站大廈、貨運站、維修站等設施，在機場評估或規劃機場的容量時，必須整體考量機場各設施容量，所以只要任何的設施容量不足都會使得機場的進出入境作業程序有所問題，由於設施不足使得航務組人員的機門指派作業顯得相重要。

目前國內機場機門指派作業大多是以人工方式規劃，這樣不僅缺乏系統最佳化的考量，也會較沒有效率，所以利用整數規劃的方式建立一個機門指派模式，讓航務人員可以更有效率的規劃機門指派作業。

本研究探討航務人員在機門指派作業時，依照機場的停機坪指派原則、航空公司偏好、機型停機停相容性等，應用數學規劃方式建構一個完善的機門指派模式，並以高雄國際機場為例，利用最佳化軟體 AMPL/CPLEX 求解，讓機場管理單位、航空公司、旅客等，都得到較好的滿意度，並且提供高雄國際機場航務組一個可以實際運作的指派模式。

Abstract

The airport is a national critical facility, Taiwan goes abroad the population to continue every year to increase, therefore the airport operation fit and unfit quality can directly affect the passenger. Machine the gate appoints the work to relate the overall airport system the operation, its role is quite important. When the airport appoints the work to be smooth only then may let all enter a country, leave country or the favourable turn passenger has a better degree of satisfaction, also may reduce airline many costs (baggage 、 ground cost...etc) , as well as lets each passenger all obtain high quality flies the navigation service.

The air station system main facility including facility and so on runway, taxiway, aircraft parking area, navigation station building, freight terminal, maintenance station, at the airport appraised when or plans the airport capacity, must the whole consider the airport various facilities capacity, therefore so long as any facility capacity is insufficient can cause the airport the turnover to enter a country the operational procedure to have a question, because the facility insufficient causes the administrative personnel machine the gate to appoint the work to appear importantly.

At present the domestic airport mostly is by the artificial way plan, like this not only lacks the system optimization the consideration, also can comparatively not have the efficiency, therefore establishes a machine gate using the integer plan way to appoint the pattern, enables the administrative personnel to be allowed the more effective plan machine gate to appoint the work.

This research discussion administrative personnel appoints the work when machine the gate, appoints the principle, the airline according to the airport aircraft parking area, the type engine off to stop compatibly and so on by chance, the applied mathematics plan way constructs a perfect machine gate to appoint the pattern, and take the Kaohsiung international airport as the example, solves using optimization software AMPL/CPLEX, lets the airport administrative, the airline, the passenger and so on, all obtains a better degree of satisfaction, and provides Kaohsiung international airport administrative personnel to be allowed actually to operate appoints the pattern.