

影片製作問題之分支與界定法

A New Branch-and-Bound Algorithm for Film Production Problem

林妙聰

銘傳大學資訊管理學系副教授

Associate Professor

Department of Information Management, Ming Chuan University

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摘要：影片製作問題是某電影製作公司所實際面連的一項最佳化作業，其主要目的是排列一組拍片順序，以使得演員滯留成本能降至最小。此問題業已被證明為strongly NP-hard，之前亦有學者提出分支與界定法作為解題策略。在本文中，我們將設計擴充之實質效益，我們進行了電腦程式的實際模擬，而實驗結果也顯示此方法確實在縮減搜尋空間及時間上均有顯著效果。

關鍵詞：影片製作、滯留成本、最佳化、分支與界定法

Abstract: In this paper, we consider is an optimization problem that arises in the film industry. The film production problem seeks to find an arrangement of shooting days such that the holding costs of actors/actresses are minimized. This problem was previously shown to be NP-hard in the strong sense. Based on an existing branch-and-bound algorithm, we present in this paper a new one by incorporating a tighter lower bound function. A series of computational experiments are conducted, and the results reveal the practical significance of the proposed function.

Key word: Film production, holding cost, optimization, branch-and-bound algorithm

1. 問題介紹

在影片得拍攝過程中，包括有諸如交通、道具或佈景、人事等等的成本因素。在一個實際案例中，助理導播(the first assistant director) 想藉由數學模式與電腦運算來輔助拍片過程中的演