

題目	臺灣鐵路號誌維修人員調度最佳化
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摘要	本研究探討臺灣鐵路局鐵路信號維修人員調度問題。由於勞動標準法的修訂和鐵路維修人員的短缺，傳統的人工排班方式難以快速且準確地安排所需的維修任務。本研究提出了一個數學最佳化模型來處理鐵路信號維修任務中的員工調度問題。此人員調度問題被模式化成為一個帶約束的整數線性規劃問題，在符合勞動法規要求的條件下，最大限度地降低總成本，並且平衡全體員工的工作量。實驗結果與傳統人工調度結果相比，本研究所提出的員工調度模型不僅可以滿足工人的權利，滿足維修質量要求，還可以平衡全體員工的工作量，最大限度地降低員工的總體人事成本。總之，本研究所提出的解決方案可以準確預測所需人力的數量，也能配合使用不同技能的維修人員，達到符合法規要求的最小總體人士成本。
關鍵字	調度；勞動標準法；成本最佳化；整數規劃
Title	Optimization of Personnel Scheduling for Railway Signal Maintenance in Taiwan
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Abstract	This research focuses on the personnel scheduling for the railway-signal maintenance of Taiwan's Railway Administration. Due to the revision of the Labor Standards Act and the shortage of railway maintenance mechanics, traditional scheduling method cannot accurately satisfy both the maintenance requirements and the labor rights. Therefore, this study proposes a mathematical optimization model to deal with personnel dispatch for the maintenance of railway signals. This scheduling problem is modeled as a mixed integer linear programming problem. The objective is to minimize the total personnel cost while balancing the workload of all mechanics considering the norms of Labor Standards Act. The experimental results show that the proposed algorithm can greatly reduce the total personnel cost and satisfy all legal requirements than the traditional manual method. In conclusion, the proposed method can serve as a guidance for personnel scheduling in several railway maintenance situations to minimize the overall personnel cost of railway-signal maintenance
Keywords	Scheduling; Labor Standards Act; Cost Optimization; Integer Programming