以模擬退火法求解單元形成問題

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摘 要

單元製造系統（CELLULAR MANUFACTURING SYSTEM），為群組技術（GROUP TECHNOLOGY）之應用，近幾年來由於其可簡化生產流程、降低整備時間、減少物料處理，減少品質問題等優點，可以有效地降低成本，因此廣泛的受到專家學者的研究與探討。而單元形成問題為單元製造系統中最重要的環節之一，由於它 具有NP-COMPLETE 特性，因此對於大型問題，欲在可接受的時間內求得最佳解相當困難，故一般皆以啟發 式演算法求得近似最佳解。本研究以模擬退火法（SIMULATED ANNEALING）來求解兩類型之單元形成問題， 一為標準單元形成問題，另一類為考量多途程之單元形成問題。在問題的目標函數上，本研究採用近年來在 單元形成問題上，普遍受到一般學者所使用的績效指標－群組效力（GROUP EFFICACY）做為上述兩類型之單 元形成問題的目標函數。群組效力能夠同時考量例外元素最小化與單元內使用率最大化兩個在單元形成問 題上最實際也最重要之目標，使得本研究之結果更符合現實。而在與其他學者做演算績效上之比較時也將更 為客觀與方便。本研究以文獻中之例題測試標準單元形成問題與考量多目標之單元形成問題，演算法參數使 用SAS 統計軟體分析決定。研究結果顯示，所有例題之演算結果均優於或等於其他學者之結果。可證明本研 究所提出之演算法有不錯之表現。

關鍵詞 : 群組技術、單元形成、模擬退火法、群組效力

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