利用模擬退火演算法求解不規則物件排列及切割問題

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摘 要

不規則物件之排列及切割在日常生活中常常碰上，但由於時間之考慮及物件需求量太多，而導致很難將不規則物件利用數學規劃法、目視法或經驗法則，而將物件妥當安排在適當的位置上，使得物料之浪費量可以減低，進而讓工廠可以對物料進行控制與管理，增加社會財富。 科技日新月異，利用人工來完成物件排列 / 切割作業之型態將逐漸不適用。本研究鑒於上述之考量，建立一模擬退火演算法（Simulated Annealing，SA）來取代人工之經驗法則所產生出來之排列結果。 由於不規則物件之排列及切割上被歸類為NP-Hard型之問題，所以由單純之數學規劃法，勢必無法在設定時間內求出最佳解，因此本研究利用萬用啟發式工具其中之一的模擬退火演算法之機制，再加上三個特殊改良式移步法則，配合溫度、馬可夫鍊、冷卻率及目標函數之設定，快速找尋最佳之排列 / 切割方式。希望本研究建構之模擬退火演算法模式，可以供給實務界當作一參考方向，作為本研究之最好論證。

關鍵詞 : 模擬退火法 ; 排列問題 ; 切割問題 ; 不規則物件

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