轉接點位址問題之啟發式解法

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摘 要

軸幅式路網(HUB-AND-SPOKE NETWORK)的結構，有助於總運輸成本的降低，其中影響的關鍵在於轉接點(HUB)的位址與需求點(NONHUB)的分派決策。本研究主要針對轉接點位址問題(HUB LOCATION PROBLEM, HLP)求解，主要目的在找到最佳的轉運點位址與需求點的分派決策，使整個網路中之總運輸成本最小化。由於HLP具有NP-COMPLETE的特性，要在短時間內求得最佳解十分困難，故文獻中大多以啟發式方法求得近似解。 模擬退火法(SIMULATED ANNEALING, SA)是一種高階的萬用啟發式演算法，非常適合求解組合最佳化問題，而禁忌搜尋法(TABU SEARCH, TABU)中之禁忌名單(TABU LIST)能有效避免演算過程中之重複搜尋，因此本研究之求解方法主要應用模擬退火法結合禁忌名單，發展出一個新的啟發式演算法 - SAHUB；此外，本研究亦採用了拉氏鬆弛法(LAGRANGIAN RELAXATION)，藉由求解簡化後之鬆弛模式，與次梯度(SUBGRADIENT)方法的應用，以求解轉接點位址問題。 為了測試演算法之穩健性，本研究以文獻中之例題，分別針對單一分派與多重分派下之HLP做測試，除了在參數分析部分找到最合適之參數組合外，並分別測試演算法中不同起始解與移步策略之演算績效。研究結果顯示，本研究所提出之SAHUB演算法，有相當優異的表現；而拉氏鬆弛演算法亦可獲得不錯之結果。

關鍵詞 : 轉接點位址問題，模擬退火法，拉氏鬆弛法

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