隨機型區位 : 途程問題解法之研究

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摘 要

本研究主要是針對區位-途程規劃(LRP)與隨機區位-途程規劃問題(SLRP)做一研究。由於LRP為一個NP-Hard問題，而且問題內容包含區位分派問題及車輛途程問題，因此非常複雜難解。Perl &Daskin [50]最早提出一個較完整的求解方法，但因為他們所提出之演算法相當複雜且耗時，所以本研究根據Perl &Daskin所提出之演算法作一修正，將LRP分解成為下列三個子問題：⑴區位分派問題，⑵車輛途程問題，⑶途程重新指派問題。再根據上述三個子問題分別求解。各子問題雖可使用最佳化方式求解，但由於他們皆屬於NP-Hard問題，為恐無法處理規模較大之LRP問題，本研究再針對各個子問題，分別發展啟發式演算法，並且結合模擬退火法(SA)，以求迅速獲得近似最佳解。而在SLRP部分，因實務上LRP問題之需求量往往呈現不確定性，於是本研究採用機會限制式(Chance-Constrained Programming；CCP)及邊界處罰模式(Bounded Penalty)來求解SLRP問題。 在過去之研究中，往往假設車隊為單一車種且車輛數無限，此明顯與實際不符，因此我們再構建多車種且車輛數有限之LRP/SLRP模式，並發展啟發式解法。最後為了測試演算法之穩健性(Robustness)，除了針對文獻例題外，本研究再針對問題題型之參數及演算法內部參數廣泛設計各種不同組合之測試例題。演算結果顯示本研究提出之演算法在各種LRP/SLRP題型中均有不錯之表現。

關鍵詞 : 區位-途程問題 ; 隨機型區位-途程問題 ; 模擬退火法

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