引導式基因演算法應用於Connector為基之組裝規劃

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摘 要

組裝規劃是設計者以個人的經驗法則，依據產品的設計描述規劃出一定的組裝順序，最後根據此組裝順序將產品的各個零件組合而成一個產品。本研究與傳統Liaison graph搭配基因演算法的研究不同之處，在於本研究試圖在Connector-based環境下以引導式基因演算法來求解組裝規劃問題。所謂的connector是以零件間的「結合方式」作為產品描述之依據，本身扮演著設計階段觀念層次的建構單元(Concept product building block)，故可包含著更多的工程資訊，以較為高階的資訊探索組裝規劃，將可有效地降低搜尋的複雜度。本研究將以Tseng et al. (2004)所建議之Connector-based組裝規劃模式做為基礎，並且結合引導式基因演算法求解最佳組裝順序。 基因演算法之演化程序是一種隨機盲目搜尋程序，故當組裝規劃問題限制條件過於複雜時，會造成基因演算法在演化程序中產生大量的不可行解，進而降低基因演算法之求解品質與效率，因此本研究之引導式基因演算法企圖改善初始母體的給定、交配與突變機制，以期許能求解限制式較複雜之組裝規劃問題。 最後本研究以釘書機、電風扇與印表機等三個例子，來證明引導式基因演算法的可行性，結果本研究發現引導式基因演算法可以有效的解決限制式較複雜之組裝規劃問題，而且引導式基因演算法之求解效率優於Tseng et al. (2004)所提出之基因演算法。

關鍵詞 : 組裝規劃、基因演算法、Connector

目錄

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