綠色導向產品模組化之研究

李家佃、曾懷恩 ; 郭文宏

E-mail: 9423701@mail.dyu.edu.tw

摘 要

市場激烈的競爭造成企業為了滿足顧客的需求，必需製造更多的產品來供應消費者選擇，企業通常必須以較大量零件及模組(Module)的庫存策略來因應頻繁的變異，而這種變異會導致產品的零件(Component)與模組相互間的組合與分離也比以往更為複雜化，設計者更困擾頻繁的變異行為造成大量過渡期產品之零組件，因應此問題近年來興起模組化設計來解決。本研究試圖發展一個模糊語意變數評估方式，並加入工程屬性觀點，評估零件間的關聯性，工程屬性包括有接觸方式、連結性、工具性、易接近性，最主要目的是提供設計者在設計階段充滿不確定的因素有個依據，本研究採用集群基因演算法當分群的演算法，集群基因演算法的最大特色是可以彈性的分群，修改集群基因演算法的初始化利用貪婪演算法給定多樣的解，並在交配法階段修正法則以符合模組化設計的限制。並且試圖加入一套合理的綠色材料分析，當作分群後綠色模組改善工具，進一步提出建議變更的低污染材料與變更設計，以改善模組內污染值較高的零件，本研究流程則以檯燈為例進行說明。

關鍵詞 : 模組化 ; 集群基因演算法 ; 模糊數 ; 綠色設計

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