結合粗略集合理論、支援向量機及最佳化演算法於製造系統之應用

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摘 要

本研究主要目的為結合粗略集合理論、支援向量機及最佳化演算法於製造系統之應用。製造系統中除了精確辨識產品品質外，當產品品質出錯時，有完善知識庫立即提供修正法則，縮減系統停工時間更顯重要。本研究基於以上考量結合多類支援向量機與粗略集合理論，建立一套能同時辨識產出品質與整理系統修復規則之架構。一般支援向量機參數 和 是以格式搜尋法（Grid Search）與交叉驗證法(cross validation)求得，但搜尋時間因分類資料量之增加而增長。有鑑於此，本研究以免疫演算法同時找尋支援向量機的兩個參數，改善搜尋效率，並以交叉驗證法輔助支援向量機訓練分類模型，避免模型過度訓練或訓練不足。粗略集合理論可從不完整的資料中整理出重要資訊，本研究依此特性萃取製造過程中辨識產出品質的關鍵屬性，並歸類產出品質與機器參數之關係法則，做為系統修復的診斷系統。本研究以兩組製造系統資料與三組標準之非製造資料驗證此套模型效能。

關鍵詞 : 多類支援向量機 ; 粗略集合理論 ; 免疫演算法

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