Using Support Vector Machines, Rough Set and Optimization Algorithm for Manufacturing System

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E-mail: 9509803@ mail.dyu.edu.tw

ABSTRACT

Diagnosing quality faults is one of the most crucial issues in manufacturing processes. Many techniques have been presented to diagnose fault in manufacturing systems. The SVM approach has received more attention due to its classification ability. However, the development of support vector machines (SVM) in the diagnosis of manufacturing systems is rare. Therefore, this thesis attempts to apply the SVM in the diagnosis of manufacturing systems. Furthermore, rough set and Immune Algorithm are employed to determine two parameters of SVM model correctly and efficiently. Five numerical examples are use to demonstrate the diagnosis ability of the proposed DSVMIA+RS (directed acyclic graph support vector machines with Immune Algorithm and rough set) model. The experiment results show that the proposed approach can classify the faulty product types correctly and efficiently.

Keywords : Multi-support vector machine ; Rough set ; Immune algorithm

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