發展以視覺化訊號為基礎之故障診斷

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摘 要

在本論文裡一個以視覺化聲學與振動訊號為基礎之研究方法被用於內燃機引擎的故障診斷，對於轉動 機械而言其所發出之聲學效應(Acoustic emission)與振動量(Vibration signals)之訊號皆可用來監 測當機械轉動時我們人類眼睛所目測不到之運轉狀態，於一般故障診斷方法上大都是以聲學效應與振 動量之訊號，在時間軸和頻率面上所顯示出不同振幅量之大小進行故障診斷。但不幸的是在實際的訊 號量測時會造成訊號失真的原因，往往都是由於背景噪音(Background noise)以及頻率抹平(Frequency smearing effect)之現象而影響實驗結果的真實性與可靠性。在本研究裡我們提出一個以視覺化聲學 訊號與振動訊號的技術(Visual dot pattern technique)對內燃機引擎與車輛傳動軸作故障診斷，且 在各種不同的故障狀態下進行診斷。從實驗的結果可得知此研究方法確實可有效的應用在內燃機與傳 動軸的故障診斷。

關鍵詞 : 視覺化訊號技術,內燃機,故障診斷,傳動軸,頻率抹平,聲學效應,振動量

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