

# 雷射二極體物鏡表面瑕疵之光學自動檢測系統研究

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## 摘要

本論文主要以影像視覺系統架構下，發展雷射二極體物鏡瑕疵之自動檢測技術。本研究由CCD影像擷取系統取得雷射二極體物鏡影像，再透過影像處理技術進行瑕疵檢測。而瑕疵檢測方法，我們分別發展空間域與頻率域兩種影像處理技術。在空間域中，首先利用影像色彩空間轉換，得到物鏡清晰灰階影像，且透過中值濾波、二值化、編幅長碼等方法，降低環境雜訊之干擾，並且尋找物鏡邊界點座標，再經由最小平方法找出最佳的物鏡位置，最後再結合Otsu與型態學方法做瑕疵辨識。而頻率域中是應用Haar小波轉換技術，以擷取物鏡影像在不同空間尺度（Scale）位置下的頻率域特徵來做瑕疵檢測，包括物鏡裂痕和污點等瑕疵，並經由實際實驗來證明本文所提方法之有效性。

關鍵詞：雷射二極體；瑕疵檢測；影像處理；機器視覺

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