內視鏡影像之扭曲校正與病兆面積之量測

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摘 要

以內視鏡之檢查來量測病兆之面積大小，對疾病之診斷、治療方法以及病情追蹤等具有重要的參考價值。然而內視鏡為擴大觀察範圍，故以廣角鏡頭製作而成，使得顯現出來的影像與原始相比會有極大的扭曲，此種扭曲情況以中心點為準，呈輻射狀向外擴散並愈趨嚴重，故而在病兆大小之判斷上有相當的困難度，也造成傳統所常用的目測方法有很大的誤差。本研究計劃將針對此影像扭曲的效應作深入的探討並加以修正，以建立一套較準確的測量法則以便和傳統方法作比較。我們將證明輻射的扭曲效應在極座標上會更加容易分析。扭曲和修正後的影像基本上可以兩個座標系統來相互映射，而其相互間的轉換可以一種特殊的正交多項式來描述。此修正方法對平面的目標影像相當有效，正確率亦頗高。而在病兆面積之量測，則採圖形使用者介面，以聚類種子成長法計算病兆像素在整張影像上所佔之比例，來計算實際面積。在模擬驗證上將先對內視鏡鏡頭的規格與特性先作一番探討，再以規則狀的影像來實踐座標轉換的系統，最後再應用到實際的人體器官影像。

關鍵詞 : 病兆面積、內視鏡、醫學影像、正交多項式、座標轉換

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