應用於乳房磁振造影醫學影像之腫瘤偵測與辨識的研究

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摘 要

針對乳房磁振造影醫學影像，本論文提出腫瘤偵測與辨識系統。此系統包含腫瘤偵測與腫瘤辨識兩個子系統。腫瘤偵測子系統是一種基於切片內分析、紋理分析、切片間分析和模糊分類器所構成。切片內分析是利用非感興趣區之移除，排除胸腔內部之器官，再根據 Ellipse Fitness 之區域生長演算法則，找出較精確之腫瘤候選區域，並計算腫瘤候選區域內像素灰階值之亮度特性，提供系統進行腫瘤偵測。紋理分析是基於腫瘤候選區域進行特徵擷取，並利用類神經網路降低系統上腫瘤判定之 False alarms。切片間分析是根據腫瘤候選區域之連續特性和大小變化特性，提供系統進行腫瘤偵測。最後根據上述所提及的腫瘤特性，提供模糊分類器進行腫瘤診斷，進而偵測出腫瘤區域之位置。

本論文之腫瘤辨識子系統是由腫瘤之形狀分析與多層式類神經網路所構成。首先將已偵測出的腫瘤區域進行形狀分析，獲得多種不同類型之形狀特徵，透過多層式類神經網路進行腫瘤形狀特徵之整合。基於類神經網路分析之結果進行良惡性風險評估。

根據實驗結果顯示，本論文所提出之腫瘤偵測子系統可以準確地檢測出腫瘤區域位置。同時本論文所提出的腫瘤辨識子系統亦能夠有效地協助醫師對惡性腫瘤的辨識與長期追蹤。

關鍵詞 : 腫瘤檢測、模糊分類器、醫學影像

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