前後期電腦斷層掃描影像的3D影像定位

李致瑋、張世旭

E-mail: 9806832@mail.dyu.edu.tw

摘 要

追蹤病人前後期肺部腫瘤之病情使用電腦斷層掃描（Computed Tomography scan，CT）檢查，尤其病人在拍攝CT影像時，前後不同時期患者的身體會有旋轉平移等幾何差異，醫生得花費更多時間用肉眼交叉比對前後期影像以追蹤病患的病情。因此本論文提出將前後期的胸腔斷層掃描3D影像定位系統，先一步將前後期影像定位，再顯示給醫生看，減少醫生定位的時間。

本論文完成許多的影像處理技術包括有骨頭萃取（Bone Extraction）、基準線的找尋（Find Baseline Searching）、粗比對定位（Coarse Registration）、骨頭區域的標記（Labeling）和細比對定位（Fine Registration）等技術。在粗比對定位部份，使用基準線尋找旋轉及平移量再進行定位，非常的快速又有效率。因先進行粗比對定位，可減少在細比對中尋找的幾何參數及嘗試次數，進而減少比對時間。

實驗使用的前後期CT影像為醫療數位影像傳輸協定（Digital Imaging and Communication in Medicine，DICOM）格式，每組序列影像為60-90張不等，每張影像實際的厚度為0.5公分。

由於前後期影像已經過定位，可將前後期影像重疊，並以不同明暗度表示，醫生可比較前後期腫瘤的大小，以追蹤腫瘤是否改善或惡化。

關鍵詞 : 電腦斷層掃描、影像比對定位、電腦輔助系統、骨頭區域標記、醫療數位影像傳輸協定

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