

三維呈像技術之整合及其在醫療影像之應用

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摘要

三維呈像技術在醫療影像重建的應用上一直扮演著重要的角色，最常見的包括表面呈像（surface rendering）與實體呈像（volume rendering）這兩種技術。然而在實際醫療臨床應用上，都僅侷限於單一技術的使用：表面呈像雖可以讓醫師看見物體之立體化呈現，卻無法得知體素（voxel）的灰階值；實體呈像雖可以顯示物體的灰階資訊，卻難以呈現該物體之立體結構。本論文提出一個整合上述表面呈像及實體呈像的方法，並透過VTK（Visualization Toolkit）所支援之視覺化功能，將此兩種呈像技術加以結合；而整合後的結果，不但可以清楚地呈現物體的立體結構，也可在由使用者所指定的平面上，顯示該物體的灰階資訊。同時，我們也將此項技術應用於虛擬大腸鏡中，讓醫生不再只是遊走並觀察大腸內部腸壁皺摺的結構，而是能進一步針對所感興趣的區域，在指定的平面上顯示相關的灰階資訊。該項技術與外科病理特徵的進一步結合，不但可以幫醫師節省許多的診斷時間，對於息肉存在與否或良惡性之判斷也會有很大的助益。

關鍵詞：三維呈像，表面呈像，實體呈像，虛擬大腸鏡

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