以方向性的距離轉換擷取曲線骨架 = Curve Skeleton Extraction Using Directional Distance Transform

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摘 要

曲線骨架為一種簡化複雜物體的表示方式，在許多視覺化相關的技術中非常有用，例如虛擬導航、動畫，醫療影像等等。擷取曲線骨架的方法非常多，不同的演算法也會有不同的問題產生。參考相關的演算法之後發現，較少演算法有提供可修改之參數讓使用者可以經過這些參數的修改，擷取出不同的曲線骨架。

本篇論文提出以方向性的距離轉換擷取曲線骨架之演算法，以距離轉換之方法為基礎，加上流水的概念，找出符合我們演算法定義的特徵點，也就是前述之曲線骨架。首先，找出物體每一個點到邊界的最短距離，再以這個最短距離找出最近的邊界；利用找出來的邊界可以定義出每一個點的角度跟方向；接著，利用角度和方向找出特徵點；找出來的特徵點修剪後即為該物體之曲線骨架。

本篇論文以方向性的距離轉換擷取曲線骨架之演算法，配合我們所建置的實驗平台，提供使用者可調整的參數，讓使用者可以依照需求更改參數，再利用我們的演算法擷取出符合使用者需求之曲線骨架。此外，我們的演算法對於單一測試影像，使用不同方向所擷取之曲線骨架，並不會產生差異。

關鍵詞 : 中軸轉換、曲線骨架、方向性的距離轉換、數位影像處理

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