基於小波與支持向量機演算法之人臉偵測研究

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摘 要

成功的人臉偵測是後續人臉辨識的重要基礎，因此準確之人臉偵測技術在人臉辨識中扮演著相當重要的角色。本文首先提出基於知識與特徵之人臉偵測演算法，以解決橢圓標定誤判之問題。其次，基於支持向量機之人臉偵測演算法亦被提出，以用來解決因亮度不足造成膚色分割不完整之問題。 基於知識與特徵之人臉偵測演算法，主要是利用人臉特徵以進行臉部擷取與定位。本文所提出之橢圓標定及三角標定均能快速且正確的標定人臉，其中利用眼睛與嘴巴所構成之幾何特徵三角標定，更能降低橢圓標定易產生誤判之機率。 至於基於支持向量機之人臉偵測演算法，其方法是透過大量樣本之學習訓練，以達到人臉偵測的目的。本文首先採用支持向量學習機器(Support Vector Learning Machines)訓練產生多重色彩空間膚色模型(multi-color space skin color model)，再配合區域方塊閥值設定，可有效解決因亮度不足、背光與陰影下膚色分割不完整之問題。當膚色被順利分割出來後，人臉特徵可採用預先以SVM訓練完成之灰階臉模型來加以框取。因此透過膚色分割與灰階臉搜尋規則，便能降低灰階臉框架比對之次數，但誤判之機率仍需進一步降低。

關鍵詞 : 人臉偵測 ; 膚色分割 ; 支持向量機

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