人臉影像定位之研究 = A study of facial image locating

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摘 要

人臉偵測是機器視覺、人臉追蹤與人臉辨識等應用的基礎，其延伸可被應用到人機界面、視訊監控、治安保全、門禁監控、醫療診斷與智慧生活等；因此，成功的人臉偵測技術蘊涵著高準確度與執行速度。 本文將人臉偵測分成兩大部分，首先利用Haar-like Feature + AdaBoost來擷取「似人臉區域」，此為第一階段處理，隨後採用LBP + SVM來濾除非人臉區域，此為第二階段處理。採用CMU人臉資料庫進行第一階段處理，newtest、test、test-low、與rotated等資料夾之人臉檢測率分別為86.1%、79.0%、45.8%與38.9%；基於第一階段檢測之結果，再進行第二階段處理，各資料夾之人臉檢測率變成91.0%、69.2%、81.7%與79.1%。由實驗結果可知Haar-like Feature與LBP各具優缺點，Haar-like Feature + AdaBoost之優點為：在影像畫質不好的情況下，能夠把最多的人臉資訊保留下來，缺點為：在特徵類型不夠充份的情況下，會使得被誤判的人臉區域過多。至於LBP，由於其人臉特徵比較完整，當結合它與SVM來排除非人臉區域時，其誤檢率幾乎接近於零，效果相當顯著，但對於紋理較不顯著者，LBP也無法保留其人臉特徵。 透過實驗觀察：被漏檢的人臉大多屬於傾斜、具有大角度旋轉者，或者人臉被遮蔽者，而被誤檢者多屬於垂直或水平影像。因此，可藉由增加訓練樣本之特徵類型，例如：45度之Haar-like特徵，以減少人臉之誤判，或增加訓練樣本之多樣性，例如：配戴眼鏡或戴帽子等以改善實驗結果。

關鍵詞 : 人臉偵測;SVM;AdaBoost;LBP;Haar-like Feature

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