夜間移動人類手持光源之偵測與分析

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摘 要

現今社會經濟蓬勃發展，企業以及一般家庭對於自身的財產安全保護日趨重視。尤其是在夜晚 期間，因為光線及視線的不足，造成夜間犯罪率提高，因此需要以視覺為基礎的監視系統來監控環境 中可能的異常事件。由於夜間環境中光線不足，因此目前的監控系統多數採用價格昂貴的紅外線攝影 機，無法普及至一般家庭。因此本論文將利用平價的網路攝影機為視訊擷取設備，在昏暗的夜間室內 環境下，利用分析入侵者手持移動光源的種類與特性，以電腦視覺為基礎來建構一應用於夜間環境的 視訊監控系統。本系統可精確判定移動光源位置，並且利用光源特性預測手持者的位置，進而追蹤以 及記錄其移動，與事先建立之合法軌跡比對，以確定此可疑路徑是否合法。最後我們利用30段視訊， 擷取3525張畫面影像，針對移動光源位置的偵測(正確率98.1%)、光源種類的判別(正確率97.8%)以及 持有者位置的預測(正確率94.6%)進行實驗討論與錯誤分析。良好的實驗結果確立了本論文所提方法的 可行性。

關鍵詞 : 背景相減 ; 移動物體偵測 ; 夜間環境 ; 視訊監控系統

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