

以時間序列之物體追蹤技術探討路口 違規車輛之偵測

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摘要

本研究克服了路口車輛不易偵測與追蹤的困難，提出一使用影像技術偵測路口車輛違規事件之方法。傳統之車輛道路違規偵測使用硬體感應器，不僅成本高，而且架設或埋設不易，維護也需花費大量時間與高額成本。所以，由影像為基礎之車輛違規偵測研究也隨之流行。然而，路口的違規偵測因車輛追蹤不易，因此大部分此類的偵測系統都只做直線追蹤類型的違規偵測，例如闖紅燈違規偵測，卻少有處理路口左轉、右轉以及迴轉的違規偵測。本研究以路口違規偵測為重點，利用運動向量在時間序列上之連貫性與一致性，發展一快速之物體追蹤演算法，並且搭配違規事件偵測表，以達到同時偵測多種違規事件。本研究所發展之演算法不僅能夠偵測路口轉彎所發生的違規事件，若搭配高解析度之取像裝置，亦能針對特定車輛進行車牌比對並進行鎖定追蹤，有助於嫌疑車輛之偵防。

關鍵詞：車輛追蹤、車輛違規偵測、物體追蹤、時間序列、影像處理

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An Investigation of Intersection's Vehicle Violation Detection Using Object Tracking Based on Time Sequence

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Abstract

Hardware sensors are used in traditional vehicle violation detections, which is not only high cost for maintenance but also hard to installation. Therefore, research of using image processing for vehicle violation detections has been rapidly rising. However, for intersection violation detections, it is hard to trace vehicles at an intersection, most of such kinds of systems can only detect violations of vehicles moving rectilinearly, such as red light running violation; there are fewer detections for turning right on red, turning left on red, and U-turn on red. In the paper, we develop a fast algorithm of object tracking using the continuity and consistence of a moving-vector. Moreover, the proposed system can also detect various violations at the same time by using violation detection table.

Keywords: vehicle detection, vehicle violation detection, object detection, time sequence, image processing

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