

论文与报告

基于多特征融合的视频交通数据采集方法

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摘要

提出了一种基于多特征融合的视频交通数据采集方法, 核心思想是: 在图像中设置虚拟线圈, 假设车辆从虚拟线圈上驶过时引起像素变化, 通过识别这种像素变化来检测车辆并估计车速. 与现有技术相比, 本文的贡献在于: 1) 综合利用虚拟线圈内的前景面积、纹理变化、像素运动等特征来检测车辆, 提出了有效的多特征融合方法, 显著提高了车辆检测精度; 2) 根据单个虚拟线圈内的像素运动向量来估计车速, 避免了双线圈测速法的错误匹配问题. 算法测试结果表明本文算法能够在复杂多样的交通场景和天气条件下, 准确地检测车辆和估计车速. 在算法研究的基础上, 研制了一款嵌入式交通视频检测器, 在路口长期采集交通数据, 为交通信号控制和交通规律分析提供决策依据.

关键词 [交通数据采集](#) [视频检测](#) [多特征融合](#) [虚拟线圈](#)

分类号

Visual Traffic Data Collection Approach Based on Multi-features Fusion

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Abstract

An effective approach for visual traffic data collection based on multi-features fusion is presented. The main idea is to configure several virtual loops (detection zones) on the image, assuming moving vehicles may cause pixel intensities to change, then by identifying such pixel changes, to detect vehicles and estimate vehicle speed. The contributions of this paper are: 1) We integrate multiple features including foreground area, texture change, and pixel motion in the virtual loop to detect vehicles, and present an effective multi-features fusion approach, which can significantly improve the accuracy of vehicle detection; 2) we search the pixel motion vectors in a single virtual loop to estimate vehicle speed, avoiding the mismatching problem existing in the dual-loop detector. Algorithmic testing results show that the proposed approach is able to accurately detect vehicles and estimate vehicle speed in a wide range of traffic scenes and weather conditions. Based on the proposed approach, we developed an embedded traffic video detector, which can operate at traffic intersections to collect traffic data and provide decision-making basis for traffic signal control and traffic law analysis.

Key words [Traffic data collection](#) [video detection](#) [multi-features fusion](#) [virtual loop](#)

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