Traffic Flow Analysis in the Nighttime by Detecting Moving Headlights

林明宏、曾逸鴻

E-mail: 387185@mail.dyu.edu.tw

ABSTRACT

Taiwan is currently the highly developed countries in the world, the traffic flow is even more than last year, the demand of traffic monitoring system is also increasing, in recent years, nighttime traffic monitoring system is a very important issue in traffic monitoring system is a very important theme, and it ’ s also an emerging academic field in the image processing; freeway monitoring use the intelligent transportation systems (intelligent transportation system, ITS) to monitor traffic flow, and monitor freeway require a long time monitoring, and monitoring in the night, the equipped with infrared capabilities, extremely expensive. This study is based on through intelligent transportation systems combining general surveillance equipment, and focus on monitoring traffic flow on freeway in nighttime for traffic analysis. In this study, we use the RGB values to capture the light source in the image and detecting the headlights of a vehicle depend it ’ s moving or not. in order to count, each vehicle has at least two headlights, it must be grouping two headlights then can detecting the vehicle. In this study, we shot 15 films on freeway, in this study showed that surveillance equipment to successfully reduce nearly 75% of the cost, and the vehicle detection has 91% accuracy.

Keywords : Video image analysis、traffic flow monitoring、vehicle detecting

Table of Contents

REFERENCES

一、中文部分 [1]交通部(2013)，臺灣地區機動車輛登記用數[線上資料]，來 源: http://www.dgbas.gov.tw/mp.asp?mp=1[2012, dec 31] [2]交通部台灣區國道高速公路局(2007)，智慧型運輸系統ITS簡介[線上資料]，來源: http://www.freeway.gov.tw/Publish.aspx?cnid=1556 [2011, feb 8] [3]陳華總，蔡立武，古蕙媜，李素瑛，林寶樹(2012)，利用車燈偵測分析夜間交通壅塞情況，前瞻科技與管理期刊，2(1)，67-79。 二、英文部分 [4]Congcong Li et al.,2011,“ Joint Optimization of Background Subtraction and Object Detection for Night Surveillance ”, IEEE International Conference on Image Processing.

[5]Chen YL et al., 2009,“ Real-Time Vision-Based Multiple Vehicle Detection and Tracking for Nighttime Traffic Surveillance, ” in Proceedings of IEEE International Conference on Systems, Man, and Cybernetics, San Antonio, TX, US: Institute of Electrical and Electronics Engineers, 3352-3358.

[6]Hsieh JW et al.,2006,“ Automatic Traffic Surveillance System for Vehicle Tracking and Classification ”, IEEE Transaction on Intelligent Transportation Systems, 7, 175 187.

[7]Huang K et al., 2008,“ A Real-Time Object Detecting and Tracking System for Outdoor Night Surveillance, ” Pattern Recognition, 41, 432-444.

[8]Lee W and Ran B,2006,“ Bidirectional Road way Detection for Traffic Surveillance Using Online CCTV Videos, ” in Proceedings of IEEE International Conference on Intelligent Transportation Systems, Toronto, Canada: Institute of Electrical and Electronics Engineers, 1556-1561.

[9]Li B and Chen QM, 2009,“ Framework for Freeway Auto-Surveillance from Traffic Video, ” in Proceedings of WRI World Congress on Computer Science and Information Engineering, Los Angeles, CA, US: Institute of Electrical and Electronics Engineers, 360-365.

[10]Rao B et al., 1993,“ A Fully Decentralized Multi-Sensor System for Tracking and Surveillance, ” The International Journal of Robotics Research, 12, 20-44.

[11]Robe r t K, 2009,“ Night -Time Traffic Surveillance: A Robust Framework for Multi-Vehicle Detection, Classification and Tracking, ” in Proceedings of IEEE International Conference on Advanced Video and Signal Based Surveillance, Genova, Italy: Institute of Electrical and Electronics Engineers, 1-6.

[12]Sayed MS and Delva J, 2010,“ Low Complexity Contrast Enhancement Algorithm for Nighttime Visual Surveillance, ” in Proceedings of the 10th International Conference on Intelligent Systems Design and Applications, Cairo, Egypt: Institute of Electrical and Electronics Engineers,

835-838.
[13]Tsai LW et al., 2011, “ Multi-Lane Detection and Road Traffic Congestion Classification for Intelligent Transportation System, ” Energy Procedia, 13, 3174-3182.
[14]Tseng BL et al., 2002, “ Real-Time Video Surveillance for Traffic Monitoring Using Virtual Line Analysis, ” in Proceedings of the IEEE International Conference on Multimedia and Expo, Lausanne, Switzerland: Institute of Electrical and Electronics Engineers, 541-544.
[15]Wei Zhang et al., 2012, “ Tracking and Pairing Vehicle Headlight in Night Scenes, ” IEEE Transactions on Intelligent Transportation Systems, 13(1), 140-153.
[16]Yen-Lin Chen et al.,2011, “ A Real-Time Vision System for Nighttime Vehicle Detection and Traffic Surveillance, ” IEEE Transactions on Industrial Electronics, 58(5), 2030-2044.
[17]Wu J et al., 2007, “ Virtual Line Group Based Video Vehicle Detection Algorithm Utilizing Both Luminance and Chrominance, ” in Proceedings of 2nd IEEE Conference Industrial Electronics and Applications, Harbin, China: Institute of Electrical and Electronics Engineers, 2854-2858.