Accuracy Improvement of License Plate Tracling and Recognition

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ABSTRACT

As economic activity to flourish and traffic's complete, people have more car than before. Therefore, traffic management becomes more important. In before, traffic monitoring was using people watching video. It is very waste time and human. So our proposed a new approach to improve this status. Our tracking and recognition license plate using the sequential video images. First, our using background subtraction to detection foreground objects. Second, our using Sobel edge detection to finding foreground objects edge. Finally, using Hough transform to location the license plate. After license plate location, our extract features for tracking. Our tracking 's approach is using the license plates locations range extend double to finding license plate location in the next image. By using this approach we can get the license plates moving direction. Another, we propose an approach of license plate recognition. Our propose a specific character set recognitions core join to the recognition system, and we also propose a specific strings search mechanism for license plates search. Our using by those, specific character set recognitions core and specific strings search mechanism, to improvement license plates recognition accuracy and its search speed.

Keywords: Video surveillance systems, a specific character set, a specific string, license plate tracking and identification

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REFERENCES

一、 中文部分 交通部統計處。機動車輛登記數。2012年1月15日,取自:

http://www.motc.gov.tw/mocwebGIP/wSite/public/Attachment/f1326673691586.xlsf 二、英文部分 Anitha, M., Bhargavi, R. (2011). "Accurate License Plate Localization," International Conference on Computer, Communication & Electrical Technology — ICCCET2011, 18th & 19th Antonini, M., Barlaud, M., Mathieu, P. and Daubechies, I. (1992). "Image Coding Using Wavelet Transform," IEEE Trans on Image Processing, vol. 1, no. 2, April. Ashtari, A.H., Nordin, M.J., Kahaki, S.M.M. (2011). "A New Reliable Approach for Persian License Plate Detection on Colour Images," International Conference on Electrical Engineering and Informatics July 17-19 pp.1-5. Bernsen, J. (1986), "Dynamic thresholding of grey-level images," in Proc. 18th Int. Conf. Pattern Recognition, Paris, pp.1251-1255. Chao, K., Srinath, M.D. (2002). "Invariant character recognition with Zernike and orthogonal Fourier-Mellin moments," Pattern Recognition, vol. 35, no.1, pp. 143-154, January. Chen, Z.X., Liu, C.Y., Chang, F.L., and Wang, G.Y. (2009). "Automatic License-Plate Location and Recognition Based on Feature Salience," IEEE Transactions on Vehicula Technology, vol. 58, no. 7, September. Chen, B., Cao, W., Zhang, H. (2008). "An Efficient Algorithm on Vehicle License Plate Location," Proceedings of the IEEE International Conference on Automation and Logistics Qingdao, China Chen, Z., Wang, G., Liu, J. and Liu, C. (2009). "Automatic License Plate Location and Recognition Based on Feature Salience," International Journal of Computational Cognition (http://www.ijcc.us), vol. 5, no. 2, June. Cheokman, W., Lei, C.O., Chan, H.W., Tong, S.K., Kengchung, N.

(2005). "A Macao License Plate Recognition System," Int. Conf. on Machine Learning and Cybernetics, vol. 7, pp.4506-4510. Chim, Y.C., Kassim, A.A, Ibrahim, Y. (1999). "character recognition using statistical moments," Image and Vision Computing, vol. 17, no. 3, pp. 299-307, March. Comelli, P., Ferragina, P., Granieri, M.N., Stabile, F. (1995). "Optical Recognition of Motor Vehicle License Plates," IEEE Trans. on Vehicular Technology, vol. 44, pp. 790-799. Glauberman, M.H. (1956). "Character recognition for business machines," Proc. IEEE 80, 1066-1078, July. Hegt, H.A., Haye, R.J.D.L., Khan, N.A. (1998). "A High Performance License Plate Recognition System" IEEE International Conference on Systems, Man and Cybernetics, pp. 4357-4362, San Diego, California, USA, 11-14 October. Huang, Y.P., Lai, S.Y., Chuang, W.P. (2004). "A Template-based Model for License Plate Recognition," IEEE Int. Conf. on Networking, Sensing and Control, vol. 2, pp. 737-742. Junga, K., Kimb, K.I., Jainc, A.K. (2004). "Text Information Extraction in Images Andvid eo: A Survey," Pattern Recognition 37, 977 – 997. Khotanzad, A., Hong, Y.H. (1990). "Invariant image recognition by Zernike moments," IEEE Transactions on Pattern Analysis and Machine Intelligence, Volume 12, Page(s):489-497, May. Li, X., Zhang, L., Dong, H., Xu, J. (2010). "Comparative Study on Wavelet Transform and Traditional Image Processing, "Information Sciences and Interaction Sciences (ICIS), pp. 13-17. Lin, C.S., Wu, W.Z., Lay, Y.L., Chang, M.W. (2001). "A digital image-based measurement system for a LCD backlight odule" Optics & Laser Technology, Vol.33, pp.499 – 505. Lu, Y. (1995). "Machine printed character segmentation an overview," Pattern Recognition, vol. 28, no.1, 67-80. Lu, Y. and SHRIDHAR, M. (1996). " Character Segmentation in Handwritten Words--An Overview," Pattern Recognition, Vol. 29, No. 1, pp. 77-96. Mallat, S.G. (1989). " A Theory for Multiresolution Signal Decomposition: The Wavelet Representation, "IEEE Trans. On PAMI, vol. 11, no. 7, pp. 674-693, July. Nukano, T., Fukumi, M., Khalid, M. (2004). "Vehicle license plate character recognition by neural networks," Proceedings of the International Symposium on Intelligent Signal Processing and Communication Systems, pp.771-775. Paeisi, R., Claudio, E.D.D., Lucarelli, G., Orlandi, G. (1998). "Car plate recognition by neural networks and image processing," Proceedings of the 1998 IEEE International Symposium on Circuits and Systems, vol. 3, pp.195-198. Qin, Z., Shi, S., Xu, J. and Fu, H. (2006). "Method of License Plate Location Based on Corner Feature," Proceedings of the 6th World Congress on Intelligent Control and Automation, June 21 - 23, Dalian, China Tseng, Y.H., Kuo, C.C. and Lee, H.J. (1997). "Speeding Up Chinese Character Recognition in An Automatic Sutomatic Document Reading System," Pattern Recognition, vol.31, no.11, 1601-1612. Wu, M.K., Wei, L.S., Shih, H.C., Ho, C.C. (2009). "License Plate Detection Based on 2-Level 2D Haar Wavelet Transform and Edge Density Verification," IEEE International Symposium on Industrial Electronics July 5-8 pp. 1699-1704. Ymaguchi, J.I., Kita, T., Ishihara, Y. (2008). "Detection of License Plate Using Matched Filter," Electronics and Communications in Japan, Vol. 91, No. 9.