Vehicle Detection in a Video Frame Using Machine Learning Technology

Dr. Syed Salim[1], Hadiya Sarwath[2], Monikamallu S[2], Priyanka Gavaroji[2], Yashaswini K N[2]

Associate Professor, Department of Department of Computer Science & Engineering[1]
Final Year Students, Department of Computer Science & Engineering[2]
Vidya Vikas Institute of Engineering and Technology, Mysuru, India

Abstract: *Motion tracking is one of the most active research titles of the computer vision concepts. Vehicle detection process on road are used for vehicle tracking, counts, traffic analysis and vehicle categorizing objectives and it can be implemented under different environments changes. Vehicle counting process provides appropriate information about traffic flow, and the vehicle crash occurrences and also traffic peak times in roadways[2]. Analysis of traffic may account traffic and also streamline the process, Analysis of traffic may account for the number of vehicles in an area per some time period[1]. Most of the design involve use of sensors to detect the vehicles. As it is a detection of vehicle in a video frame it uses the algorithms like Gaussian Mixture Model background subtraction it is a widely used approach for foreground detection. By the digital image processing methods which including object detection, edge detection, frame differentiation and kalman filter using the different library and algorithm with real time image[2]. This paper describes the detection of vehicle in a video frame, tracking in the video frame, counts the number of vehicle passes through the indicative line in roadways.*

Keywords: Vehicle Detection, Tracking, Counting, Gaussian Mixture Model, Background, Foreground, Video Frame

REFERENCES

[1]. A Video based Vehicle Detection, Counting and Classification System by Sheeraz Memon

[2]. Vehicle Detection and Counting method based on Digital Image processing in Python by Reha Justin, Dr. Ravindra Kumar

[3]. S.-Y. Cheung, and P.P. Varaiya, "Traffic surveillance by wireless sensor networks: Final report", PhD diss., University of California at Berkeley, 2006.

[4]. S. Oh, S. Ritchie, and C. Oh, "Real-time traffic measurement from single loop inductive signatures", Transportation Research Record: Journal of the Transportation Research Board, (1804), pp. 98-106, 2002.

[5]. B. Coifman, "Vehicle level evaluation of loop detectors and the remote traffic microwave sensor", Journal of transportation engineering, vol. 132, no.3, pp. 213-226,2006

[6]. M. Lei, D. Lefloch, P. Gouton, K. Madani, "A video-based real-time vehicle counting system using adaptive background method", IEEE International conference on Signal Image Technology and Internet Based Systems (SITIS'08), pp. 523528, 2008.

[7]. E. Bas, A.M. Tekalp, and F.S. Salman, "Automatic vehicle counting from video for traffic flow analysis", IEEE Intelligent Vehicles Symposium, 2007.

[8]. H. Rabiu, "Vehicle detection and classification for cluttered urban intersection", International Journal of Computer Science, Engineering and Applications, vol 3, no 1, p. 37, 2013.

[9]. C. Stauffer, and W.E.L. Grimson, "Learning patterns of activity using real-time tracking", IEEE Transactions on pattern analysis and machine intelligence, 2000. Vol 22, no 8, pp. 747757, 2000.

[10]. C. Stauffer, and W.E.L. Grimson, "Adaptive background mixture models for real-time tracking", IEEE Computer Society Conference Computer Vision and Pattern Recognition, 1999.

[11]. A.B. Godbehere, A. Matsukawa, and K. Goldberg, "Visual tracking of human visitors under variable-lighting conditions for a responsive audio art installation", IEEE, American Control Conference (ACC), pp. 4305-4312, 2012.

Impact Factor: 6.252

[12]. P. Choudekar, S. Banerjee, M. K. Muju, "Real Time Traffic Light Control Using Image Processing," Indian Journal of Computer Science and Engineering, Vol. 2, No. 1, ISSN: 09765166.

[13]. W. Yao, J. Ostermann, Y. Q. Zhang, "Video Processing and Communications," Signal Processing Series, ISBN: 0-13017547-1, Prentice Hall, 2002.

[14]. R. Gonzalez, R. E. Woods, "Digital Image Processing," 2nd Edition, Prentice-Hall, 2002.

[15]. Learning OpenCV: Computer Vision with the OpenCV Library By Gary Bradski, Adrian Kaehler.

[16]. X. Fu, Z. Wang, D. Liang, J. Jiang, "The Extraction of Moving Object in Real-Time Web-Based Video Sequence," 8th International Conference on Digital Object Identifier, Vol. 1, pp. 187-190, 2004.

[17]. M. Fathy, M. Y. Siyal, "An Image Detection Technique, Based on Morphological Edge Detection and Background Differencing for Real-time Traffic Analysis," Pattern Recognition Letters, Vol. 16, pp. 1321-1330, 1995.

[18]. M. Tursun, and G. Amrulla, "A video based real-time vehicle counting system using optimized virtual loop method", IEEE 8th International workshop on Systems Signal Processing and their Applications (WoSSPA), 2013.