

Automatic License Plate Recognition Using Deep Learning

Goutham Krishna V and Associate Prof. Kala L
Department of Electronics and Communication Engineering
NSS College of Engineering, Palakkad, Kerala

Abstract: *This project presents a core module for intelligent transportation based on the method Haar-like cascade classifier for high accuracy license plate detection. Many real-time car license plate detection is reasonable and effective only under certain conditions and assumptions. Therefore a real-time method Haar-like cascade and Tesseract search for Optical Character Recognition (OCR) has been proposed. Using accurate prediction and fast analysis strategy our proposed system can constructively out pass the problems in real-time scenarios. After binge analyzing the system with various inputs to establish that the proposed system is superior to the existing systems in terms of accuracy and time consumption. The video from the traffic block is divided into different frames and a single frame is taken. An image is taken from the video frame in which the license plate will be detected in real time. After Detection of the License plate, the characters in the license plate are recognized.*

Keywords: Haar

REFERENCES

- [1] Chang, S.-L., Chen, L.-S., Chung, Y.-C., Chen, S.-W. (2004, March). Automatic license plate recognition. IEEE Transactions on Intelligent Transportation Systems, 5(1), 42–53. doi:10.1109/TITS.2004.825086
- [2] Du, S., Ibrahim, M., Shehata, M., Badawy, W. (2013, February). Automatic License Plate Recognition (ALPR): A State-of-the-Art Review. IEEE Transactions on Circuits and Systems for Video Technology, 23(2), 311–325. doi:10.1109/TCSVT.2012.2203741
- [3] Łubkowski, P., Laskowski, D. (2017). Assessment of Quality of Identification of Data in Systems of Automatic Licence Plate Recognition. In J. Mikulski (Ed.), Smart Solutions in Today's Transport. TST 2017. Communications in Computer and Information Science (Vol. 715). Cham: Springer. doi:10.1007/978-3-319-66251-039
- [4] Bj rklund, T., Fiandrotti, A., Annarumma, M., Francini, G., Magli, E. (2017). Automatic license plate recognition with convolutional neural networks trained on synthetic data. In 2017 IEEE 19th International Workshop on Multimedia Signal Processing (MMSP), Luton (pp. 1-6). doi:10.1109/MMSP.2017.8122260
- [5] Panchal, T., Patel, H., Panchal, A. (2016). License plate detection using Harris corner and character segmentation by integrated approach from an image. Procedia Computer Science, 79, 419–425. doi:10.1016/j. procs.2016.03.054
- [6] Azam, S., Islam, M. M. (2016). Automatic license plate detection in hazardous condition. Journal of Visual Communication and Image Representation, 36, 172– 186. doi:10.1016/j.jvcir.2016.01.015
- [7] Yuan, Y., Zou, W., Zhao, Y., Wang, X., Hu, X., Komodakis, N. (2017, March). A robust and efficient approach to license plate detection. IEEE Transactions on Image Processing, 26(3), 1102–1114. doi:10.1109/ TIP.2016.2631901 PMID:27893394
- [8] Yingyong, Z., Jian, Z., Yongde, Z., Xinyan, C., Guangbin, Y., Juhui, C. (2015). Research on algorithm for automatic license plate recognition system. International Journal of Multimedia Ubiquitous Engineering, 10(1), 101–108. doi:10.14257/ijmue.2015.10.1.9
- [9] Davis, A. M., Arunvinodh, C. (2015, March). Automatic license plate detection using vertical edge detection method. In 2015 International Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS) (pp. 1-6). IEEE. doi:10.1109/ICIIECS.2015.7193073

- [10] Nishani, E., C, ic , B. (2017). Computer vision approaches based on deep learning and neural networks: Deep neural networks for video analysis of human pose estimation. In 2017 6th Mediterranean Conference on Embedded Computing (MECO) (pp. 1-4).doi:10.1109/MECO.2017.7977207
- [11] ZXie, L., Ahmad, T., Jin, L., Liu, Y., Zhang, S. (2018, February). A New CNN- Based Method for Multi Directional Car License Plate Detection. IEEE Transactions on Intelligent Transportation Systems, 19(2), 507–517. doi:10.1109/TITS.2017.2784093
- [12] Wang, Yu., Ban, X., Chen, J., Hu, B., Yang, X. (2015). License plate recognition based on SIFT feature. Optik-International Journal for Light and Electron Optics, 126(21),2895–2901. doi:10.1016/j.ijleo.2015.07.040
- [13] Nguwi, Y. Y., Lim, W.J. (2015). Number plate recognition in noisy image. In 2015 8th International Congress on Image and Signal Processing (CISP), Shenyang (pp. 476- 480).doi:10.1109/CISP.2015.7407927
- [14] Khan, J. A., Shah, M. A., Wahid, A., Khan, M. H., Shahid, M. B. (2017). Enhanced car number plate recognition (ECNPR) system by improving efficiency in preprocess- ing steps. In 2017 International Conference on Communication Technologies (ComTech), Rawalpindi (pp. 156-161). doi:10.1109/COMTECH.2017.8065766.
- [15] Badr, A., Abdelwahab, M. M., Thabet, A. M., Abdelsadek, A. M. (2011). Automatic number plate recognition system. Annals of the University of Craiova- Mathematics and Computer Science Series, 38(1), 62–71.
- [16] Masood, S. Z., Shu, G., Dehghan, A., Ortiz, E. G. (2017). License plate detection and recognition using deeply learned convolutional neural networks. arXiv:1703.07330
- [17] Goodfellow, I. J., Bulatov, Y., Ibarz, J., Arnoud, S., Shet, V. (2013). Multi-digit number recognition from street view imagery using deep convolutional neural networks.arXiv:1312.6082.
- [18] Abadi, M., Barham, P., Chen,J., Chen, Z., Davis, A., Dean,J., Kudlur, M. et al. (2016,November). TensorFlow: a system for large-scale machine learning. In Proceedings of the 12th USENIX conference on Operating Systems Design and Implementation (pp. 265-283). USENIX Association.
- [19] Saleem, N., Muazzam, H., Tahir, H. M., Farooq, U. (2016). Automatic license plate recognition using extracted features. In 2016 4th International Symposium on Computational and Business Intelligence (ISCBI), Olten (pp. 221-225). doi:10.1109/ISCBI.2016.7743288
- [20] Cao, Y., Qi, H., Zhou, W., Kato, J., Li, K., Liu, X., Gui, J. (2018). Binary Hashing for Approximate Nearest Neighbor Search on Big Data: A Survey. IEEE Access: Practical Innovations, Open Solutions, 6, 2039–2054. doi:10.1109/ACCESS.2017.2781360
- [21] de Campos, T. E., Babu, B. R., Varma, M. Character recognition in natural images. In Proceedings of the International Conference on Computer Vision Theory and Applications (VISAPP), Lisbon, Portugal.