IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, June 2022
Impact Factor: 6.252

Image Based Pothole Detection System through Machine Learning

Sournalakshmi P[1], Reni Hena Helan R[2], Divyalaxmi R[3], Kala Ranjini D[4], Rajalakshmi H[5]
Assistant Professor, Computer Science and Engineering[1,2]
Student, Computer Science and Engineering[3,4,5]
Dhanalakshmi College of Engineering, Chennai, India

Abstract: *Potholes can cause damage such as punctures and wheel damage, dents and vehicle floor damage, vehicle collisions and serious accidents. Therefore, accurate and fast hole detection is one of the important tasks to determine the good strategic in the ITS (Intelligent Transportation System) service and in the route management system. Several efforts have been made for developing a technology which can automatically detect and recognize potholes, Since the image related to road damage includes objects such as holes, cracks, shadows and tracks, there is the problem that it is difficult to detect a specific object. In this paper, we propose a pothole classification model using edge detection in the road image. The proposed method converts RGB (red green and blue) image data, including holes and other objects, to grayscale to reduce the amount of computation. It detects all objects with the exception of holes using an object detection algorithm. The ultrasonic sensor detects holes and alerts the user.*

Keywords: Potholes, Detection, Sharpening Filter, RGB Extraction, UV Sensor, Arduino, GSM, etc.

REFERENCES

[1] J. S. Miller and W. Y. Bellinger, "Distress identification manual for the long-term pavement performance program," United States. Federal Highway Administration. Office of Infrastructure Research and Development, Tech. Rep., 2014.
[2] S. Mathavan, K. Kamal, and M. Rahman, "A review of three-dimensional imaging technologies for pavement distress detection and measurements," IEEE Transactions on Intelligent Transportation Systems, vol. 16, no. 5, pp. 2353–2362, 2015.
[3] T. Kim and S.-K. Ryu, "Review and analysis of pothole detection methods," Journal of Emerging Trends in Computing and Information Sciences, vol. 5, no. 8, pp. 603–608, 2014.
[4] R. Fan, J. Jiao, J. Pan, H. Huang, S. Shen, and M. Liu, "Real-time dense stereo embedded in a for road inspection," in Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops, 2019, pp. 0–0.
[5] C. Koch, K. Georgieva, V. Kasireddy, B. Akinci, and, "A review on computer vision-based defect detection and condition assessment of concrete and asphalt civil infrastructure," Advanced Engineering Informatics, vol. 29, no. 2, pp. 196–210, 2015.
[6] Y.-C. Tsai and A. Chatterjee, "Pothole detection and classification using 3d technology and watershed method," Journal of Computing in Civil Engineering, vol. 32, no. 2, p. 04017078, 2017.
[7] I. Pitas, Digital image processing algorithms and applications. John Wiley & Sons, 2000.
[8] S. Li, C. Yuan, D. Liu, and H. Cai, "Integrated processing of image and GPR data for automated pothole detection," Journal of computing in civil engineering, vol. 30, no. 6, p. 04016015, 2016.
[9] E. Buza, S. Omanovic, and A. Huseinovic, "Pothole detection with image processing and spectral clustering," in Proceedings of the 2nd International Conference on Information Technology and Computer Networks, 2013, pp. 48–53.
[10] C. Koch and I. Brilakis, "Pothole detection in asphalt pavement images," Advanced Engineering Informatics, vol. 25, no. 3, pp. 507–515, 2011.
[11] M. R. Jahanshahi, F. Jazizadeh, S. F. Masri, and B. Becerik-Gerber, "Unsupervised approach for autonomous pavement-defect detection and quantification using an inexpensive depth sensor," Journal of Computing in Civil Engineering, vol. 27, no. 6, pp. 743–754, 2012.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, June 2022
Impact Factor: 6.252

[12] R. Fan, X. Ai, and N. Dahnoun, "Road surface 3D reconstruction based on dense subpixel disparity map estimation," IEEE Transactions on Image Processing, vol. PP, no. 99, p. 1, 2018.

[13] C. Zhang and A. Elaksher, "An unmanned aerial vehicle-based imaging system for 3d measurement of unpaved road surface distresses," Computer-Aided Civil and Infrastructure Engineering, vol. 27, no. 2, pp. 118–129, 2012.

[14] R. Fan, "Real-time computer stereo vision for automotive applications," Ph.D. dissertation, University of Bristol, 2018.

[15] Z. Zhang, X. Ai, C. Chan, and N. Dahnoun, "An efficient algorithm for pothole detection using stereo vision," in Acoustics, Speech and Signal Processing (ICASSP), 2014 IEEE International Conference on. IEEE, 2014, pp. 564–568.

[16] A. Mikhailiuk and N. Dahnoun, "Real-time pothole detection on tms320c6678 dsp," in Imaging Systems and Techniques (IST), 2016 IEEE International Conference on. IEEE, 2016, pp. 123–128.

[17] L. Cruz, L. Djalma, and V. Luiz, "Kinect and rgbd images: Challenges and applications graphics," in 2012 25th SIBGRAPI Conference on Patterns and Images Tutorials (SIBGRAPI-T), 2012.

[18] R. Hartley and A. Zisserman, Multiple view geometry in computer vision. Cambridge university press, 2003.

[19] M. A. Fischler and R. C. Bolles, "Random sample consensus: a paradigm for model fitting with applications to image analysis and automated cartography," Communications of the ACM, vol. 24, no. 6, pp. 381–395, 1981.