Detection Of Motorcyclists Without Helmet Using Convolutional Neural Network

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A. ABSTRACT

Enforcing use on every bike-rider is mandatory nowadays due to high accident rate and poor conditioned roads There are laws concerning safety measures which make sure use of helmets. However, currently, they contain manual intervention which isn't confirmed to be so powerful because from time to time, motorbike-riders have a tendency to get away without any penalty after breaking the protection rules like carrying a helmet even while driving. Automation is efficient & also a better manner to address this problem but it comes with its personal demanding situations. to name a few, Low satisfactory picture frames (low photo resolution, pixel density and many others.), rain, dew & fog and partly hidden faces. Consequently, the robustness of detection methodology strongly depends on the energy of extracted functions and additionally the potential to address the decreased excellence of extracted information. The primary intention of this task is to enhance the potency of helmet detection and then recognizing the license range plate popularity. This model includes many critical steps advanced using today's most advanced & optimized Convolutional Neural network (CNN), Generative Adverbial community (GAN) models & libraries. This model is a class primarily based model that uses supervised gaining knowledge of approach to educate CNN and GAN. The proposed helmet detection version may be used to discover helmets and understand license plates even in adverse conditions.

Keywords: CNN, GAN, Machine learning, Artificial Intelligence, HOG.

B. INTRODUCTION

According to an India Today survey, more than forty eight,746 motorcycle-riders died in avenue accidents in 2017. Incidentally, 73.8% of them did not wear a helmet. facts are consistent with India environment Portal [25]. Avenue injuries cause a huge number of deaths each year. The motives behind this are awful avenue situations, malfunctioning of motors, careless use or motorcycle use, now not following visitors policies and so on. of these, a few are avoidable. Like, proper protection measures taken make sure

reduction in injuries and thereby reduction in death fee. Although there's been helmet compulsion for motorbike riders, a lot of those don't use it.

This mission intends to automate the quality utility method by way of detection of helmets on biker's
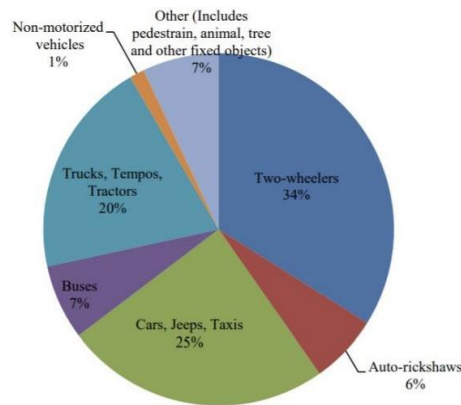
heads. Currently, the traffic cops manually apply fines for breaking the site visitors rules. But, from time to time due to lack of knowledge or due to different factors they manage to break out without first-class even after the visitors rule violation. The automation on this system will reduce such cases and consequently boom strict acts in opposition to them. The accuracy for detection of helmets is round ninety-ninety three% and license plate reputation lies around 50-60%. This accuracy wishes to be improved for efficient implementation of enforcement acts.

In recent years, the use of cameras for protection purposes, regulation enforcement purposes has improved a lot. There are approaches to stumble on helmets using image processing and system mastering. There are strategies like OpenCV approach giving 74% accuracy, The photo Descriptors approach giving accuracy of ninety one.37%, and The nearby Binary patterns (LBP) method giving accuracy of ninety four%. however these photos were not captured in actual time. The proposed system may be able to come across motorcyclists sporting the helmet using CNN. The registration code recognition is executed using the GAN set of rules

C. LITERATURE SURVEY:

[1]   Wen et al suggested a circle arc detection method based on Hough transform. They applied it to detect the presence of helmets on the surveillance system of Automatic Teller Machines. But the drawback of this work was it has used only the geometric features to detect the presence of the helmet. Geometric features are not enough to detect the presence of a helmet; many times the head can be mistaken with the helmet.

[2]   In Chiu et al it has used a computer vision based system which aims to detect and segment motorcycles partly occluded by another vehicle. Helmet detection system was used in which the presence of a helmet simplifies that there is a motorcycle. In this paper to detect the helmet edges were computed of the possible helmet region.

[3]   Chiverton et al described and tested a system for automatic classification of motorcycles with and without helmets. It has used (SVM) Support Vector Machine which is trained on (HOG) Histogram of Oriented Gradients which is derived from the head region of the static images and individual image frame from video data. By this method the accuracy rate was high but the number of testing images taken were very less.

Year	Author	Title	Approach	Limitations
2019	Emy Barnabas Et Al.	Helmet Detection and License Plate Recognition Using CNN.	A CNN to detect helmet and license plate recognition using OCR.	The accuracy of license plate recognition is very less.
2018	C. Vishnu Et Al.	Detection of Motorcyclists without Helmet in Videos using CNN	A CNN approach to detect helmet.	low accuracy and was limited only to helmet detection.
2018	Kavyashree D Et Al.	Real Time Automatic Helmet Detection of Bike Riders.	Helmet detection using background subtraction and license plate recognition using OCR.	It was not able to detect helmet when image was not clear.
2017	Kunal Dahiya Et Al.	Automatic Detection of Bike-riders without Helmet using Surveillance Videos in Real-time.	Helmet detection using feature extraction and SVM classifier.	Can't detect helmets when there was a change in atmospheric conditions.
2016	Kang Li Et Al	Automatic Safety Helmet Wearing Detection.	Uses the technique of K nearest neighbor to detect helmet.	The results were not good when images were not clear.

D. BENEFITS:

For the helmet detection problem, there are several techniques we can use to continue to improve accuracy. For example, for problems where there is not enough light in the production situation and the target occupies a small frame, we can improve algorithms such as YOLOv3 or Faster RCNN for processing such as feature fusion, multiscale detection, and increasing the number of anchor points. At the same time, we can also introduce more deep learning techniques in algorithms such as YOLOv3 or Faster RCNN, such as adding multilayer convolutional feature fu- sion techniques in building neural networks, and introducing online difficult sample mining methods in target detection to enhance the robustness of small and occluded targets in different environments, which are the directions of our future in-depth research. Sandip Foundation's SIEM, Department of Computer Engineering 2021 25

E. CONCLUSION:

The system proposed here can provide comprehensive and more accurate helmet detection and recognition of license plates against the dataset for a stream of real time CCTV footage.

F. REFERENCES:

[1] K. Dahiya, D. Singh, and C. K. Mohan, "Automatic detection of bikeriders without helmet using surveillance videos in real-time," in Proc. Int. Joint Conf. Neural Networks (IJCNN), Vancouver, Canada, 24–29 July 2016, pp. 3046–3051.

[2] D. Singh, C. Vishnu, and C. K. Mohan, "Visual big data analytics for traffic monitoring in smart city," in Proc. IEEE Conf. Machine Learning and Application (ICMLA), Anaheim, California, 18–20 December 2016.

[3] C. Behera, R. Ravi, L. Sanjeev, and D. T, "A comprehensive study of motorcycle fatalities in south delhi," Journal of Indian Academy of Forensic Medicine, vol. 31, no. 1, pp. 6–10, 2009.

[4] W. Hu, T. Tan, L. Wang, and S. Maybank, "A survey on visual surveillance of object motion and behaviors," IEEE Trans. Systems, Man, and Cybernetics, Part C: Applications and Reviews, vol. 34, no. 3, pp. 334–352, 2004.

[5] C.-C. Chiu, M.-Y. Ku, and H.-T. Chen, "Motorcycle detection and tracking system with occlusion segmentation," in Proc. Int. Workshop on Image Analysis for Multimedia Interactive Services, Santorini, Greece, 6–8 June 2007, pp. 32–32.

[6] R. Silva, K. Aires, T. Santos, K. Abdala, R. Veras, and A. Soares, "Automatic detection of motorcyclists without helmet," in Proc. Latin American Computing Conf. (CLEI), Puerto Azul, Venezuela, 4–6 October 2013, pp. 1–7.

[7] D. Jeff, J. Yangqing, V. Oriol, H. Judy, Z. Ning, T. Eric, and D. Trevor, "DeCAF: A Deep Convolutional Activation Feature for Generic Visual Recognition," Int. Conf. on Machine Learning (ICML), vol. 32, no. 1, pp. 647–655, 2014.

[8] Z. Kaihua, L. Qingshan, Wu, and Y. Ming-Hsuan, "Robust Visual Tracking via Convolutional Networks without Training," IEEE Trans. Image Processing, vol. 25, no. 4, pp. 1779–1792, 2016.

[9] G. Ross, D. Jeff, D. Trevor, and M. Jitendra, "Rich feature hierarchies for accurate object detection and semantic segmentation," in Proc. IEEE Conf. Computer Vision and Pattern Recognition (CVPR), Colombus, Ohio, 24–27 June 2014, pp. 580–587.