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Traffic Violation Detection by Using Image Processing

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Abstract: *Detection of helmeted and non-helmeted motorcyclists is mandatory nowa-days in order to ensure the safety of riders on the road. The main goal of helmets is to protect the drivers head in case of an accident. In case of an accident, if the motorcyclist does not use a helmet, it can cause fatal injury. Today violation of most of the traffic and safety rules are detected by analysing the traffic videos captured by surveillance cameras. This paper aims to propose a system for detection of motorcyclists without helmet. In this paper, we introduce an approach for automatic detection of helmeted and non-helmeted motorcyclists using Deep learning algorithm. In this paper, motorcycle riders are detected using the YOLOv4 model which is an incremental version of the YOLO model, it is a state of method for object detection. The proposed model is evaluated on traffic videos and the obtained results are promising in comparison with other CNN based approaches. Motorcycle accidents have been rapidly growing throughout the years in many countries. Due to various social and economic factors, this type of vehicle is becoming increasingly popular. The helmet is the main safety equipment of motorcyclists, however many drivers do not use it. The main goal of helmet is to protect the drivers head in case of accident. In case of accident, if the motorcyclist does not use can be fatal. This paper aims to propose a system for detection of motorcyclist without helmet. For this, we have applied the circular Hough transform and the Histogram of Oriented Gradients descriptor to extract the image attributes. Then, the MultiLayer Perceptron classifier was used and the obtained results were compared with others algorithms. Traffic images were captured by cameras from public roads and constitute a database of 255 images. Indeed, the algorithm step regarding the helmet detection accomplished an accuracy rate of 91.37%.*

Keywords: Helmet-detection, YOLO, Deep Learning, traffic violation

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