

Deep Learning Methods for Two Wheeler Number Plate Recognition and Helmet Detection

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Abstract. There are very few automobiles in developing countries because two wheelers have always been the uppermost mode of transport. Motorcycle crashes have been on the rise in the last few years. A number of people who are involved in traffic collisions include motorcyclists who do not wear reflective helmets, since they do not believe they provide sufficient protection. Once the traffic police spot those driving Motorcycles on a whole-or Motorcycles in junctions-without helmets, they also use video from CCTV to take control of the drivers of those vehicles and penal those who are riding without one. However, it can only be achieved through human action and commitment. Again they classifies moving vehicles as motorcycle or nonmotorcycle. for example, when referring to the head component, in the case of a motorcyclists, it is graded as either full face or non-full face. An excellent image analysis of the motorcycle number is then used to extract the characters that were missed by the identification software and/ Finally, the character count of the motorcycle is found, and from the motorcycle is examined using OCR software. The algorithm detects Objects to discover faces from still photos or videos. In their study "Rapid Object Detection using a Boosted Cascade of Simple Characteristics," Viola and Jones presented edge or line detection features, which are used by the technique. A deep learning algorithm called a convolutional neural network may analyse a picture as input and rank its significance. to separate elements/objects in the picture and be able to tell one from the other. Because of its great accuracy, CNNs are utilized for picture categorization and recognition. With the use of a hierarchical model, the CNN creates a network in the form of a funnel that eventually yields a fully connected layer in which all of the neurons are interconnected and the output is processed.

INTRODUCTION

Problem Statement

A non helmet rider identification system is created in this research study in an effort to automate the process of identifying the traffic infraction of not wearing a helmet and obtaining the licence plate number of the offending vehicle. The Deep Learning Technique which detects Object at three layers is the key idea at play. People, motorcycles or mopeds were discovered at the begining level using YOLOv2, helmets were detected at the next level using YOLOv3, and licence plates were detected at the final level using YOLOv2. After that, OCR is used to retrieve the licence plate registration number (Optical Character Recognition). All of these methods are subject to predetermined restrictions and circumstances, particularly the part that extracts licence plate numbers. The efficiency of the execution is essential because this job receives input video. Our work proposed a comprehensive solution for both detection of helmet and vehicle number plate extraction using the aforementioned approaches.