Helmet and Number Plate Detection using Deep Learning

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Abstract: *The number of motorcycle accidents is increasing worldwide, with head injuries being one of the most common causes of death. Riders can avoid life-threatening injuries by wearing helmets, but many choose not to use them. In order to solve this problem, the project created an automated solution that utilizes a CNN-based YOLOv3 (You Only Look Once) algorithm and Optical Character Recognition (OCR) to capture their license plate information. YOLO is a neural network model that splits images into smaller parts so that objects can be detected and classified at the same time. With the input image, the dataset is compared, and confidence scores and class probabilities are measured which leads to detection of wearing a helmet or not. In cases where the biker does not wear a helmet, physically OCR scans the number plate of a motorcycle and converts it into digital text. This text undergoes processes such as image acquisition, cleaning, recognition, and layout analysis to provide the desired output of number plate of helmetless motorcycles. This process automates detection of those who do not wear helmet and license plate details extraction for riders who do not wear helmets. Identification of these violations is done automatically which in turn, makes roads safer.*

Keywords: *YOLO V3, OCR, CNN*