

ABSTRACT

This experimentation proposes using YOLOv5 to detect waterdrops on a vehicle's camera to improve its ADAS (Advanced Driver Assistance Systems) and driver's safety in adverse weather conditions. Advanced Driver Assistance Systems or as known as ADAS is a system that helps drivers by using its camera to enhance the driver's safety such as automatic braking and detection of pedestrians. The urgency of this experiment is based on how many accidents happen whenever rain is involved, the National Highway Traffic Safety Administration shows that 70% accidents on the road happen because of wet road, and 46% contributed by the rain itself. By using the dataset that's provided which includes around 8190 images and a few more self collected, this experiment hopes to improve the system to be able to detect waterdrops with fair accuracy. The method that's being used mainly consist of pre-processing the dataset, implementation of the YOLOv5 model, and evaluation of the model itself that uses metrics such as $mAP@0.5$, $mAP@0.5:0.95$, precision, recall and inference time. This experimentation hope to be able to be a significant contribution in the improvement of advanced driver systems in rough weather conditions and contribute to the enhancement of autonomies technology that will be far safer.

Keywords: yolov5, waterdrop detection, vehicle camera, adas, computer vision, object detection.