New approach to vehicle license plate location based on new model YOLO-L and plate pre-identification

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Abstract— Currently, the conventional license plate location method fails to detect the license plate under complex road environments such as severe weather conditions and viewpoint changes. Besides, it is difficult for license plate location method based on machine learning to precisely locate the area of license plate. Moreover, license plate location method may incorrectly detect similar objects such as billboards and road signs as license plates. To alleviate these problems, this article proposes a new approach to vehicle license plate location based on new model YOLO-L and plate pre-identification. The new model improves in two aspects to precisely locate the area of license plate. First, it uses k-means++ clustering algorithm to select the best number and size of plate candidate boxes. Second, it modifies the structure and depth of YOLOv2 model. Plate pre-identification algorithm can effectively distinguish license plates from similar objects. The experimental results show that authors' proposed method not only achieves a precision of 98.86% and a recall of 98.86%, which outperforms the existing methods, but also has high efficiency in real time.

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