A Two-Stage License Plate Recognition System Using YOLOv8 and EasyOCR: Evaluation on a Large-Scale Public Dataset

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Abstract

This paper proposes an end-to-end license plate recognition (LPR) system on the basis of a two-stage pipeline synergistically combining YOLOv8 for detecting license plates and EasyOCR for character recognition. The system is experimented on a huge and heterogeneous dataset of 27,900 labeled images, which were obtained from Google Open Images and divided in a systematic way into training, validation, and test sets. The approach is focused on high detection precision and reliability in extracting text in real-world conditions. Large-scale experiments show that the system obtains a detection precision of 85.16%, character recognition precision of 100.00%, recall rate of 85.16%, and F1-score of 91.98% after 30 iterations of training. The combination of YOLOv8 and EasyOCR in a modular pipeline demonstrates robustness and flexibility, thus facilitating deployment in intelligent traffic systems.

Keywords:

License Plate Recognition (LPR), YOLOv8, EasyOCR, End-to-End System, Intelligent Traffic Systems.