

Towards Human-Level License Plate Recognition

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Abstract. License plate recognition (LPR) is a fundamental component of various intelligent transport systems, which is always expected to be accurate and efficient enough. In this paper, we propose a novel LPR framework consisting of semantic segmentation and character counting, towards achieving human-level performance. Benefiting from innovative structure, our method can recognize a whole license plate once rather than conducting character detection or sliding window followed by per-character recognition. Moreover, our method can achieve higher recognition accuracy due to more effectively exploiting global information and avoiding sensitive character detection, and is time-saving due to eliminating one-by-one character recognition. Finally, we experimentally verify the effectiveness of the proposed method on two public datasets (AOLP and Media Lab) and our License Plate Dataset. The results demonstrate our method significantly outperforms the previous state-of-the-art methods, and achieves the accuracies of more than 99% for almost all settings.

Keywords: License Plate Recognition (LPR), Semantic Segmentation, Convolutional Neural Networks (CNN), Character Counting

1 Introduction

License plate recognition (LPR) from images as a fundamental component is vitally important for various intelligent transport systems (ITS), such as security control of restricted areas [9, 28] and traffic safety enforcement [33, 16], as the license plate is generally used as the identification of a vehicle. So the LPR algorithm is always required to be accurate and efficient enough for facilitating the deployment and application in terminal equipments or transport systems. On the other hand, LPR in complex scenes that the vehicle images may be highly deformed or blurred is probably the main consideration in many real-world applications. For instance, the suspect vehicles are the mainly concerned targets that need to extract the structured information in the safety surveillance, while other normal ones can be completely ignored. But the acquired images for such vehicles are usually harder to analyze. Therefore, developing accurate and robust LPR is essential, especially for complex scenes.

LPR needs to handle the diverse illuminance conditions, image blurring, defacing, and vehicle deformation [10, 31, 2, 1, 26]. The existing works can be

