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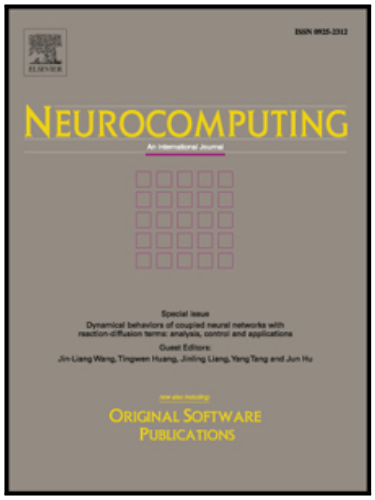

Class-Specific Object Proposals Re-ranking for Object Detection in Automatic Driving

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Class-Specific Object Proposals Re-ranking for Object Detection in Automatic Driving

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Abstract

Object proposal generation is an important step in object detection, obtaining high-quality proposals can effectively improve the performance of detection. In this paper, we propose a semantic, class-specific approach to re-rank object proposals, which can consistently improve the recall performance even with fewer proposals. Specifically, we first extract features for each proposal including semantic segmentation, stereo information, contextual information, CNN-based objectness and low-level cue, and then score them using class-specific weights learned by Structured SVM. The advantages of the proposed model are two-fold: 1) it can be easily merged to existing generators with few computational costs, and 2) it can achieve high recall rate under strict critical even using fewer proposals. Experimental evaluation on the KITTI benchmark demonstrates that our approach significantly improves existing popular generators on recall performance. Moreover, in the experiment conducted for object detection, even with 1,500 proposals, our approach can still have higher average precision (AP) than baselines with 5,000 proposals.

Keywords: Re-ranking, Object proposal, Object detection, CNN

1. Introduction

In the last few years, object proposal methods have been successfully applied to a number of computer vision tasks, such as object detection [1, 2], object segmentation [3],

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