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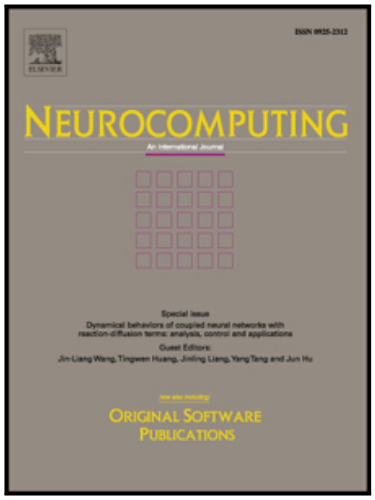

CNN-based Edge Filtering for Object Proposals

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CNN-based Edge Filtering for Object Proposals

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Abstract

Recent advances in image-based object recognition have exploited object proposals to speed up the detection process by reducing the search space. In this paper, we present a novel idea that utilizes true objectness and semantic image filtering (retrieved within the convolutional layers of a Convolutional Neural Network) to propose effective region proposals. Information learned in fully convolutional layers is used to reduce the number of proposals and enhance their localization by producing highly accurate bounding boxes. The greatest benefit of our method is that it can be integrated into any existing approach exploiting edge-based objectness to achieve consistently high recall across various intersection over union thresholds. Experiments on PASCAL VOC 2007 and ImageNet datasets demonstrate that our approach improves two existing state-of-the-art models with significantly high margins and pushes the boundaries of object proposal generation.

Keywords: Object Proposals, Region Of Interest, Object Detection, Deep Learning, Neural Networks

1. Introduction

Object Proposals generation has become a compulsory module for object detection. Instead of searching for an object at every image location and scale, a set of object bounding box (BB) proposals is first generated with the goal of reducing the set of image locations that need to be further analyzed. Object Proposals can be used in applications like object based image retrieval [5], object recognition [41, 44], and image classification [35, 34]. Use of object proposals as interest point detector in these applications can speed up the process to identify