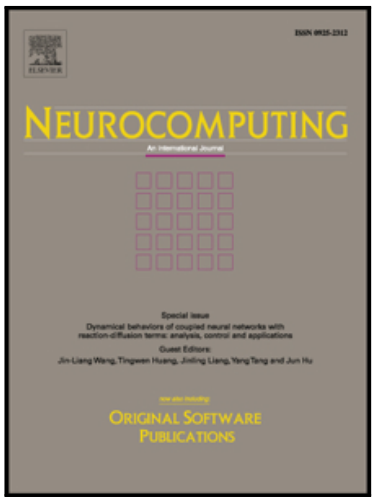

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Neural Features for Pedestrian Detection

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Abstract

This paper presents a pedestrian detection approach that uses neural features from a fully convolutional network (FCN) instead of features manually designed. We train an AdaBoost detector per layer and compare the performance to find the optimal layer for this task. Combining results of multiple detectors can further improve the performance. In order to adapt the FCN to pedestrian detection task, we fine-tune it with bounding boxes labels. Using neural features generated by fine-tuned FCN, the log-average miss rate (MR) on Caltech pedestrian dataset is 18.79% by a single detector and 16.50% by combining two detectors. We also evaluate the proposed method on INRIA pedestrian dataset and the MR is 11.17% with a single detector and 9.91% through combining two detectors. The improved performance indicates that the proposed neural features are applicable to pedestrian detection task, due to their strong representation.

Keywords: pedestrian detection, neural features, fully convolutional network

1. Introduction

Recently, the field of artificial intelligence has achieved significant progress and many relevant applications [1, 2] have appeared. Pedestrian detection is a classical and important task in computer vision. There are many real-life applications, such as robotics, video surveillance and autonomous driving. And there has been lots of research on pedestrian detection over the past few years.

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