

基于 Faster RCNN 行人检测算法研究与实现

摘 要

随着智能化时代的发展,行人检测技术在如今的生活中得到了越来越广泛的应用。从行人检测的提出迄今为止一直是计算机深度学习以及神经网络领域研究中的热议话题还有攻坚难点。摆在行人检测技术面前问题有:在给定的图像或者视频中检测并分辨出所有的行人,其中的内容包括了行人的大小以及位置问题,找到以后用矩形框框出识别的目标内容。

本文主要是通过 Faster RCNN 算法对于进行行人检测算法研究与实现。选取 VGG16 特征提取网络模型作为本课题的基础模型。主要需要构建卷积神经网络,其中也包括了对 RPN 网络的构建, Roi 池化层的构建。通过 python 进行算法的实现,用测试集进行测试。从而实现行人检测的实现。

本文通过在 python3.6 上的编程,完成程序的编写,构建出了 RPN 网络算法,完成了 ROI 池化层程序的编写, faster rcnn 整个结构的程序。最终 mAP 值与 AP 值相等,为 0.856,符合行人检测范围值。完成了 faster rcnn 对于行人检测算法的实现。

关键词: 智能; 行人检测; 深度学习; 计算机神经网络; Faster RCNN 算法; 卷积神经网络

ABSTRACT

With the development of the intelligent age, pedestrian detection technology has been more and more widely used in today's life. So far, pedestrian detection has been a hot and difficult research object in the field of computer deep learning and neural network. The problems in front of pedestrian detection technology are: detect and distinguish all pedestrians in a given image or video, including the size and location of pedestrians, and find out the target content identified with a rectangular frame later.

In this paper, fast RCNN algorithm is used to research and implement pedestrian detection algorithm. Vgg16 feature extraction network model is selected as the basic model of this project. It mainly needs to construct convolution neural network, including the construction of RPN network and ROI pooling layer. The algorithm is implemented by Python and tested by test set. Thus, the realization of pedestrian detection is realized.

In this paper, through the programming on Python 3.6, the program is completed, the RPN network algorithm is constructed, the ROI pooling layer program is completed, and the whole structure program of foster RCNN is completed. The final map value is equal to the AP value, which is 0.856, in line with the pedestrian detection range value. The implementation of fast RCNN for pedestrian detection algorithm is completed

Keywords: Intelligence; pedestrian detection; deep learning; computer neural network; fast RCNN algorithm; convolutional neural network

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