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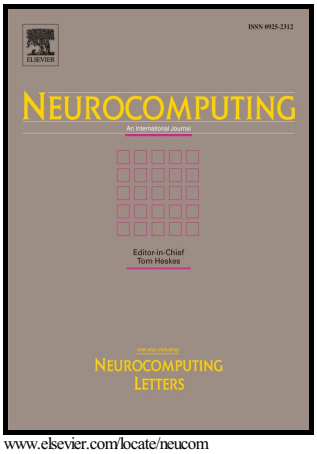

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Weizhi Nie, Anan Liu, Zhongyang Wang, Yuting Su

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Effective 3D Object Detection based on Detector and Tracker

Weizhi Nie[a], Anan Liu[a,b], Zhongyang Wang[a], Yuting Su[a]

[a]*School of Electronic Information Engineering, Tianjin University*
[b]*Corrsponding author: Anan Liu, Email: anan0422@gmail.com*

Abstract

In recent years, the understanding the semantics of 3D scenes has been a wide interesting researching point in many application. However, 3D scenes detection remains many problems, due to the difficulty in acquiring sufficient 3D model towards training effective classifiers. In order to address these problems, in this paper, we first publish a new real-world 3D model dataset MV-RED, which includes 505 objects recoded by Kinect camera. Then we propose a novel 3D object detection approach in real-world scenes combined RGB image based on MV-RED dataset. In order to improve the detection precision, we also utilize the tracking method to improve the detection results. Finally, we evaluate our approach on the RGB-D dataset which is provided by [18], achieving much greater efficiency and comparable accuracy. Our approach shows further major gains in accuracy when the training data from the target scenes is used, outperforming state-of-the-art approaches with far better efficiency.

Keywords: 3D object detection, Exemplar SVM, 3D object dataset, Tracking,

1. Introduction

With the development of 3D visual acquisition equipment [27][26], especially, Kinect sensors, we can easy to get 3D point clouds dataset [33], which leads that 3D scene context labeling and detection are becoming a hot topic in compute vision. More and more researchers pay more attention on this research region. The existing work mainly focuses on 3D object detection. Its solution can bring a breakthrough in a wide variety of computer vision

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