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APPLICATION OF IMPROVED TARGET DETECTION ALGORITHM IN AERIAL REMOTE  
SENSING IMAGE**Abstract**

Target detection is one of the core tasks of computer vision. With the development of artificial neural networks, target detection has been greatly improved and gradually applied to more fields. In this paper, an improved algorithm combining super-resolution reconstruction and Faster RCNN is proposed to detect small targets in aerial remote sensing images. Aerial remote sensing image is taken from several hundred meters to nearly ten thousand meters, which leads to many targets in aerial remote sensing image are small targets. Although the target detection algorithm based on CNN have made the huge progress in improving the performance of target detection algorithms, there is still a big gap between the detection performance of large targets and small targets. The main reason is that the small target just occupies a small proportion of pixels in the image, which contains less information, and when the image passes through multiple convolutional layers, the resulting feature map may not keep the characteristics of the small target. Thus, in order to solve these problems, the article proposes an improved algorithm based on the Faster RCNN structure. We aim to increase the feature information of small targets by fusing super-resolution reconstruction methods. Besides, in order to solve the problem that there is only a little feature information contained in small targets, the algorithm sets a threshold to reconstruct the candidate frames generated by RPN network in Faster RCNN with super-resolution. Then it inputs the image of small target candidate frames with increased feature information into the original network to complete the target detection task. In addition, the paper introduces feature pyramid network (FPN) algorithm into the original Faster RCNN network structure. By combining the high-resolution of low-level features with the high semantic information of high-level features, it makes a separate prediction on each feature layer after fusion. We evaluated our proposed architecture on the highly competitive aerial remote sensing image dataset (RSOD-Dataset). The framework proposed in this paper effectively improves the accuracy of small target detection in aerial remote sensing images, and provides a foundation for the research of target detection in aerial remote sensing images.