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(57) Abstract :

Deep convolutional neural network (DCNN) can achieve ship detection mission on the high-resolution remote sensing images. However, the false alarms caused by the onshore ship-like objects may decrease the accuracy and feasibility of these DCNN-based detection frameworks. In this work, an end-to-end method, named as Scene Mask R-CNN, is proposed to reduce the onshore false alarms. The scene mask extraction network (SMEN), as a network branch for scene segmentation, is innovatively introduced into the detection framework. The non-target area is marked out by an inferred scene mask which is used to assist the ship detection. Combining the feature map originated from feature extraction network (FEN) with the inferred scene mask by using the edge probability weighted (EPW) merging method, the false candidate targets in the nontarget area are excluded. This novel mechanism of DCNN-based ship detection not only maintains the detection accuracy, but also effectively suppresses the false alarms in the non-target area. Finally, the validity and accuracy of this method are verified on a ship dataset generated by the high-resolution optical remote sensing images.

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