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# Sea-Land Segmentation Method Based on the Transformer with Enhanced Edge Supervision

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**Abstract :** Sea-land segmentation is a basic step in many tasks such as sea surface monitoring and ship detection. The existing sea-land segmentation algorithms have poor segmentation accuracy, and the parameter adjustments are cumbersome and difficult to meet actual needs. Also, the current sea-land segmentation adopts traditional deep learning models that use Convolutional Neural Networks (CNN). At present, the transformer architecture has achieved great success in the field of natural images, but its application in the field of radar images is less studied. Therefore, this paper proposes a sea-land segmentation method based on the transformer architecture to strengthen edge supervision. It uses a self-attention mechanism with a gating strategy to better learn relative position bias. Meanwhile, an additional edge supervision branch is introduced. The decoder stage allows the feature information of the two branches to interact, thereby improving the edge precision of the sea-land segmentation. Based on the Gaofen-3 satellite image dataset, the experimental results show that the method proposed in this paper can effectively improve the accuracy of sea-land segmentation, especially the accuracy of sea-land edges. The mean IoU (Intersection over Union), edge precision, overall precision, and F1 scores respectively reach 96.36%, 84.54%, 99.74%, and 98.05%, which are superior to those of the mainstream segmentation models and have high practical application values.

**Keywords :** SAR, sea-land segmentation, deep learning, transformer
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