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SHIP TARGET DETECTION WITH SPATIAL AND SEMANTICS INFORMATION IN
HIGH-RESOLUTION AND LARGE-SCALE SAR IMAGES

Abstract

With the ability of acquiring large areas of data in all-weather and full-time situation, synthetic aperture radar (SAR) has played a magnificent role in information acquisition. Ship target detection in SAR imagery is a critical component for marine traffic management and intelligent surveillance. The traditional methods of SAR ship target detection rely on manual design features and have difficulty in detecting small scale ships with complex background clutter. Recent advances in deep learning have attracted great attention in SAR image interpretation as a promising solution for target detection and recognition. In this paper, we propose a ship detection algorithm based on convolutional neural network to solve the low detection accuracy and high false alarm rate problems in large SAR image. The feature extraction network is designed according to the characteristics of ship targets, which enriched the spatial and semantics information by using physically related electromagnetic scattering characteristics of the targets. Experiments on AIR-SARShip dataset with the Gaofen-3 images confirm the effectiveness and efficiency of the proposed method.