

## عنوان مقاله:

Convolutional Neural Networks with Different Dimensions for PolSAR Image Classification

## محل انتشار:

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## خلاصه مقاله:

Efficiency of convolutional neural networks (CNNs) with different dimensions is assessed for polarimetric synthetic aperture radar (PolSAR) image classification in this work. This article is the extended version of the paper presented in "4 International Conference on Soft Computing (CSC2021)". A PolSAR image contains polarimetric and spatial information of materials present in the scene. So, processing of these information in one, two or three dimensions results in different outputs. Three simple architectures of CNNs with different dimensions are proposed for PolSAR image classification in this paper. A one dimensional CNN (1D CNN) is suggested for polarimetric feature extraction. A 2D CNN is presented for spatial feature extraction and a 3D CNN is introduced for polarimetric-spatial feature extraction. The performance of CNNs are compared with morphological profile of PolSAR cube when fed to the support vector machine (SVM) and random forest (RF) classifiers. The experiments are done in two cases of using 1% and 5% training samples. Superiority of 3D CNN compared to other methods is shown using different quantitative classification measures.

## کلمات کلیدی:

PolSAR, Classification, feature extraction, CNN

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