A WEIGHTED FEATURE REDUCTION METHOD FOR POWER SPECTRA OF RADAR HRRPS (WedPmOR9)

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Abstract :

Feature reduction is an important stage in pattern recognition. This paper deals with the feature reduction methods for a time−shift invariant feature, power spectrum, in radar automatic target recognition using high−resolution range profiles (HRRPs). Several existing feature reduction methods in pattern recognition are analyzed, and a weighted feature reduction method based on Fisher's discriminant ratio (FDR) is proposed. According to the characteristics of radar HRRP target recognition, the proposed weighted feature reduction method uses an iterative algorithm to search for an optimal weight vector for power spectra of HRRPs to reduce feature dimensionality. Compared with using the raw power spectra and some existing feature reduction methods, the weighted feature reduction method can not only reduce the feature dimensionality, but also improve the recognition performance with low computation complexity. In the recognition experiments based on measured data, the proposed method is robust to different test data and achieves good recognition results.

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