

论文

无线传感网中多传感器特征融合算法研究

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摘要

面向无线传感器网络在地面目标识别方面的应用需求, 该文提出了一种基于改进局域判别基(Local Discriminant Bases, LDB)和二进制粒子群优化(Binary Particle Swarm Optimization, BPSO)方法的多传感器特征融合算法。利用新的基于概率密度估计的相对微分熵可分性测度来改进LDB, 以提取目标信号的特征频段, 然后分别利用一种改进的和一种全新的BPSO来实现特征融合。基于实地采集到的地面目标的声音和震动信号, 仿真实验表明, 该方法减少了所需分类器的数目, 降低了特征维数, 并在一定程度上提高了目标的正确识别率, 具有实际的应用价值。

关键词 [无线传感器网络](#) [特征融合](#) [局域判别基](#) [二进制粒子群优化](#) [可分性测度](#)

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Research on Multi-Sensor Feature Fusion Algorithms in Wireless Sensor Networks

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Abstract

A multi-sensor feature fusion algorithm based on improved Local Discriminant Bases (LDB) and Binary Particle Swarm Optimization (BPSO) is proposed in this paper to satisfy the requirement of application on classification of ground targets in wireless sensor networks. LDB is improved by a new discriminant measure using relative differential entropy based on probability density estimation and used to extract the characteristic frequency band of signals. Then an improved and a new BPSO are used for feature fusion respectively. Based on real acoustic and seismic signals of ground targets, experiment results indicate that this method can decrease the classifier number needed, reduce the dimension of features, and improve the performance of classification at a certain extent, so it is practically valuable for application.

Key words [Wireless sensor networks](#) [Feature fusion](#) [Local Discriminant Bases \(LDB\)](#) [Binary Particle Swarm Optimization \(BPSO\)](#) [Discriminant measure](#)

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