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短文与研究通讯

基于瞬时包络特征的跳频电台个体识别方法

顾晨辉,王伦文

电子工程学院309室

摘要：

通信电台发射的信号通常表现出一定的细微特征差异，针对这种细微特征差异，本文在论证跳频信号跳变瞬时包络可以作为电台个体细微特征的基础上，提出了一种基于跳频信号瞬时包络特征的跳频电台个体识别方法。首先基于一种改进的基于小波变换的包络提取算法，提取出了样本信号跳变时刻的瞬时包络，并减轻了噪声等因素的影响。其次，分离并定量计算其盒维数和信息维数等瞬时特征，将得到的跳频信号的瞬时细微特征变换为一个特征向量，之后采用基于构造型神经网络的分类方法实现不同跳频电台的个体识别。最后对实际工作状态下3种型号电台进行个体识别，实际数据的实验结果验证了算法的有效性。

关键词： 跳频电台；瞬时包络；盒维数；信息维数

Individual Frequency Hopping Radio Identification Method Based on Instantaneous Envelope Characteristics

GU Chen-Hui, WANG Lun-Wen

309 Research Division of Electronic Engineering Institute,Hefei

Abstract:

The radio communication signals usually turn out to be some fine character differences. In this paper, .after analyzing the instantaneous envelope of the frequency hopping signals which can be used as the fine characteristics of the individual communication transmitter, a method based on the instantaneous envelope of frequency hopping signals is presented to identify the individual frequency hopping radio according to the fine character differences. Firstly, the instantaneous envelope of the frequency hopping signals is extracted based on an improved wavelet transform algorithm of envelope extracting, the influence of noises is reduced. Secondly, the transient characteristics including the box dimensions and the information dimension are computed, the Instantaneous fine character of the hopping signals is transformed into a feature vector. Then, individual identification of the different frequency hopping radio based on the method of the Constructive Neural Network is realized. Finally, three different types of radio in real work are used to verify the validity, and the experimental results of the actual data have shown that our method is efficiency.

Keywords: frequency hopping radio instantaneous envelope box-counting dimension information dimension

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通讯作者:

作者简介:

作者Email: haiguch@126.com

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