

无线传感器网络中一种新型加权Mel滤波器组

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摘要：

本文提出了一种提取车辆声音特征的新型加权Mel滤波器组进行车辆的识别。这种新型滤波器组通过赋予各离散频率不同的权重，突出车辆频谱之间差异较大频段的信息，弱化较为相似频段的信息。相比于传统的Mel滤波器组，加权Mel滤波器组的识别能力得到了显著提高。仿真和实测结果均表明，与两种常用的特征提取方法相比，加权Mel滤波器组不仅能更有效地提取不同类型车辆间的差异信息，获得更高的正确识别率，还降低了计算复杂度。

关键词：无线传感器网络；特征提取；加权Mel滤波器组(WMFB)；正确识别率；计算复杂度

A Novel Weighted Mel-filter Bank in Wireless Sensor Networks

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Abstract:

This paper develops a novel Weighted Mel-filter Bank (WMFB) used in acoustic feature extraction for vehicle classification. This novel filter bank emphasizes the frequency spectrum where the vehicles are more distinct while attenuates the frequency spectrum where the vehicles are less distinct by placing different weights on separated frequency. The discriminating ability of weighted Mel-filter bank obviously increases compared with conventional Mel-filter bank. Simulated and experimental results both show that WMFB not only shows more effectiveness in extracting distinct features between different types of vehicles than two frequently used feature extraction methods and achieves higher correct recognition ratio, but also reduces the complexity of computation.

Keywords: wireless sensor network; feature extraction; Weighted Mel-filter Bank (WMFB); correct recognition ratio; complexity of computation

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