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Extraction to Filter-Bank-Based Speech
Recognition.**

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AN APPLICATION OF DISCRIMINATIVE FEATURE EXTRACTION TO FILTER-BANK-BASED SPEECH RECOGNITION

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Abstract

A pattern recognizer is usually a modular system which consists of a feature extractor module and a classifier module. Traditionally, these two modules have been designed separately, which may not result in an optimal recognition accuracy. To alleviate this fundamental problem, the authors have recently developed a novel design method, named Discriminative Feature Extraction (DFE), that enables one to design the overall recognizer, i.e., both the feature extractor and the classifier, in a manner consistent with the objective of minimizing recognition errors. This paper investigates the application of this recent method to designing a speech recognizer that consists of a filter-bank feature extractor and a multi-prototype distance classifier. Carefully investigated experiments demonstrate that DFE achieves the design of a better recognizer and provides an innovative recognition-oriented analysis of the filter-bank, as an alternative to conventional analysis based on psychoacoustic expertise or heuristics.