Abstract

Noisy ambient conditions pose a challenge to speech recognition, increasing the acoustic confusability, thereby looking for powerful acoustic models to improve the generalization ability of the machine learning and improve the recognition accuracy. This paper discusses a hybrid classifier that harness the power of hidden markov models (HMM) and the discriminative support vector machines (SVM) applied to a wavelet front end based automatic speech recognition (ASR) system. The experiments are performed on speaker independent TIMIT database which are trained in a clean environment and later tested in the presence of additive white gaussian noise (AWGN) for various SNR levels using the HTK toolkit, SVMLib and SVMLight software tool. Experiments indicate that for large vocabulary the classification power of SVMs and the elegant iterative training algorithms for the estimation of HMMs together as a hybrid classifier with the wavelet front end performs better than the conventional classifiers.

**Index Terms**

Computer Science  
Pattern Recognition

**Keywords**

Hidden Markov Models  
Support Vector Machines  
Automatic Speech Recognition  
Perceptual Wavelet Packets