

An On-line Speaker Adaptation Method for HMM-based Speech Recognizers

András Bánhalmi* and András Kocsor*

Abstract

In the past few years numerous techniques have been proposed to improve the efficiency of basic adaptation methods like MLLR and MAP. These adaptation methods have a common aim, which is to increase the likelihood of the phoneme models for a particular speaker. During their operation, these speaker adaptation methods need precise phonetic segmentation information of the actual utterance, but these data samples are often faulty.

To improve the overall performance, only those frames from the spoken sentence which are well segmented should be retained, while the incorrectly segmented data should not be used during adaptation. Several heuristic algorithms have been proposed in the literature for the selection of the reliably segmented data blocks, and here we would like to suggest some new heuristics that discriminate between faulty and well-segmented data. The effect of these methods on the efficiency of speech recognition using speaker adaptation is examined, and conclusions for each will be drawn.

Besides post-filtering the set of the segmented adaptation examples, another way of improving the efficiency of the adaptation method might be to create a more precise segmentation, which should then reduce the chance of faulty data samples being included. We suggest a method like this here as well which is based on a scoring procedure for the N-best lists, taking into account phoneme duration.

Keywords: speech recognition, speaker adaptation, faulty transcripts, confidence measures, a posteriori phoneme probabilities

1 Introduction

The probabilistic models for speech recognition are normally trained on a large amount of data samples that contain utterances recorded from many speakers. While these speaker-independent models usually operate with a quite similar and acceptable performance for most speakers, speaker-dependent models which are

*Research Group on Artificial Intelligence of the Hungarian Academy of Sciences and University of Szeged H-6720 Szeged, Aradi vértanúk tere 1., Hungary, E-mail: {banhalmi, kocsor}@inf.u-szeged.hu