A Study of Vowel Normalization Methodologies

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Abstract

This thesis compares vowel normalization methods from two approaches: statistics and cognitive sciences. It introduces an automaton model to the human speech perception mechanism, and discusses several dominant vowel normalization methods with this model. In order to evaluate the efficiency of each normalization methods, several experiments are conducted, and the results are processed with statistic methods. The most effective method evaluated is adopted in processing data from six different dialects.

This thesis also investigates the mechanism of human speech perception. An ANN model is constructed to simulate six virtual speakers of different dialects and compute their mutual intelligibility. Through the simulation this thesis tries to find out the role played by the phonemes in human vowel recognition.