Phoneme Based Speech Recognition

Using Self-Organizing Map

by

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Abstract

Automatic speech recognition by machine is a challenging task for man-machine communications. Because speech waveform is nonlinear and variant, a speech recognition algorithm requires much intelligence and an ability to accommodate variations. In this thesis, a hybrid speech recognizer based on self-organizing map (SOM) and fuzzy neural network (FNN) is proposed. The SOM is used to obtain the optimal phoneme response patterns of speech signal by Viterbi search algorithm and the FNN is applied for the recognition matching of these 2D speech response patterns on the SOM to fulfill the speech recognition tasks. Experiment results show that this hybrid speech recognizer is a feasible approach and could provide meaningful recognition results for dependent speech recognition. This thesis also compares this hybrid speech recognizer with the Hidden Markov Model, analyzes two types of misclassification for independent speech recognition and provides some suggestions for future research.
REFERENCES


