ABSTRACT

The hidden Markov models have been widely used in speech recognition systems. However, the conditional independence of the state output will force the output of a hidden Markov model to be a piecewise constant random sequence, which is not a good approximation for many real processes. In this paper, a piecewise linear high-order hidden Markov model is proposed to better approximate the real process. An expectation-maximization based algorithm was presented for the parameter estimation of the proposed model. Experiments on speech recognition of Mandarin digits were conducted to examine the effectiveness of the proposed method. Experimental results show that the proposed method can reduce the recognition error rate significantly compared to a baseline hidden Markov model.

Keywords: Expectation-maximization; Parameter estimation; High-order hidden Markov model; Speech recognition

REFERENCES