ABSTRACT
The hidden Markov models have been widely applied to systems with sequential data. However, the conditional independence of the state outputs will limit 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 high-order hidden Markov model for piecewise linear processes is proposed to better approximate the behavior of a real process. A parameter estimation method based on the expectation-maximization algorithm was derived for the proposed model. Experiments on speech recognition of noisy 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 compared to a baseline hidden Markov model.

Keywords: expectation-maximization; parameter estimation; high-order hidden Markov model; speech recognition

REFERENCES