Artificial neural network based autoregressive modeling technique with application in voice activity detection

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Abstract

A new method of estimating the coefficients of an autoregressive (AR) model using real-valued neural network (RVNN) technique is presented in this paper. The coefficients of the AR model are obtained from the synaptic weights and adaptive coefficients of the activation function of a two layer RVNN while the number of neurons in the hidden layer is estimated from over-constrained system of equations.

The performance of the proposed technique has been evaluated using sinusoidal data and recorded speech so as to examine the spectral resolution and line splitting as well as its ability to detect voiced and unvoiced data section from a recorded speech. Results obtained show that the method can accurately resolve closely related frequencies without experiencing spectral line splitting as well as identify the voice and unvoiced segments in a recorded speech.