عنوان مقاله:

New Quantum-PSO Metaheuristic and Its Application to ARMA Modeling of Speech Spectrum

محل انتشار:

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خلاصه مقاله:

In speech signal representation models, autoregressive moving average (ARMA) modeling is used in various applications, such as feature extraction, signal coding, speech synthesis, and speech recognition. In this paper, new method based on quantum-behaved particle swarm optimization (QPSO) is proposed for estimation of ARMA model coefficients. In the proposed algorithm called PMF-QPSO (probability mass function QPSO), by storing some of the last global best particles in memory, based on their fitnesses, they are given chance to influence the motion of the next generation particles, which reduces the risk of stopping in local optima and increases the exploration of QPSO algorithm. Also, to ensure the stability of the estimated model, line spectral frequencies (LSF) are used as optimization parameters, and, accordingly, thetruncated Laplace distribution is considered for the probability distribution of new particle locations. The implementation of the suggested algorithm in highorder ARMA models on set of speech signals shows that the proposed method compared to the previous ARMA modeling techniques improves the logarithmic spectral distance measure and compared to the previous QPSO algorithms, performs better in terms of the accuracy and speed of convergence.

کلمات کلیدی: