Abstract

In this paper newly developed teaching-learning based optimization (TLBO) algorithm is applied for designing band pass (BP) and band stop (BS) digital IIR filters. TLBO is heuristic algorithm based on the social phenomenon of teaching-learning process. The effectiveness of purposed algorithm is validated by designing the BP and BS filters by approximating the magnitude response with Lp-norm error criterion, minimizing pass band and stop band ripples along with guaranteed stability. The results obtained employing TLBO are compared to those obtained by the well known evolutionary algorithms such as hierarchical genetic algorithm, hybrid taguchi genetic algorithm and immune algorithm. The results reveal that the purposed TLBO algorithm gives better optimal filter in terms of magnitude response and ripples in pass band and stop band.

References


Index Terms

Computer Science  Information Sciences

Keywords

IIR filter  teaching-learning based optimization  magnitude response  band pass  band stop  stability

Lp-approximation error.