LOW−RESOURCE DELAYLESS SUBBAND ADAPTIVE FILTER USING WEIGHTED OVERLAP−ADD (MonAmOR1)

Author(s) :

Hamid Sheikhzadeh (AMI Semiconductor Canada Company, Canada)
Robert L. Brennan (AMI Semiconductor Canada Company, Canada)
Zamir Khan (AMI Semiconductor Canada Company, Canada)
Kevin R. L. Whyte (AMI Semiconductor Canada Company, Canada)

Abstract :

A delayless structure targeted for low−resource implementation is proposed to eliminate filterbank processing delays in subband adaptive filters (SAFs). Rather than using direct IFFT or polyphase filterbanks to transform the SAFs back into the time−domain, the proposed method utilizes a weighted overlap−add (WOLA) synthesis. Low−resource real−time implementations are targeted and as such do not involve long (as long as the echo plant) FFT or IFFT operations. Also, the proposed approach facilitates time distribution of the adaptive filter reconstruction calculations crucial for efficient real−time and hardware implementation. The method is implemented on an oversampled WOLA filterbank employed as part of an echo cancellation application. Evaluation results demonstrate that the proposed implementation outperforms conventional SAF systems since the signals used in actual adaptive filtering are not distorted by filterbank aliasing. The method is a good match for partial update adaptive algorithms since segments of the time−domain adaptive filter are sequentially reconstructed and updated.

Menu