Abstract

A New parallel FIR Filter structures is proposed based on fast-finite impulse response algorithms, which are beneficial to symmetric coefficients. Parallel (or block) FIR digital filter can be used either for high speed or low-power (with reduced supply voltage) applications. The New parallel FIR structures exploit the inherent nature of symmetric coefficients reducing half the number of multipliers in sub-filter section at the expense of additional adders in pre-processing and post processing blocks. The overhead from additional adders does not increase along the length of the FIR Filter; moreover adders weigh less than multipliers in terms of silicon area. Overall the new parallel FIR structures can lead to significant hardware savings.
New Architecture of Parallel FIR Filter using Fast FIR Algorithm

for symmetric convolutions from existing FFA parallel FIR filter especially when the length of the
filter is large. The new parallel FIR structures consisting of advantageous polyphase
decomposition dealing with symmetric convolutions comparatively better than the existing FFA
structures.

References

- Yu-Chi Tsao and Ken Choi "Area-Efficient Parallel FIR Digital Filter Structures for
  Symmetric Convolutions Based on Fast FIR Algorithm" feb2012
- D. A. Parker and K. K. Parhi, "Low-area/power parallel FIR digital filter
- J. G. Chung and K. K. Parhi, "Frequency-spectrum-based low-area low-power
- Z. -J. Mou and P. Duhamel, "Short-length FIR filters and their use in fast
- J. I. Acha, "Computational structures for fast implementation of L-pathand L-block
- C. Cheng and K. K. Parhi, "Hardware efficient fast parallel FIR filterstructures
- C. Cheng and K. K. Parhi, "Furthur complexity reduction of parallelFIR
- C. Cheng and K. K. Parhi, "Low-cost parallel FIR structures with 2-stage
  Feb. 2007.

Index Terms

Computer Science
Digital Signal Processing

Keywords
Digital Signal Processing (dsp)  fast Finite Impulse Response (fir) algorithm (ffas)  Parallel
Fir
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