Abstract

This paper highlights the design of finite impulse response (FIR) filter with the help of an evolutionary optimization technique, particularly multiple constant multiplication. The Finite Impulse Response (FIR) Filter is the necessary part for coming up with associate economical digital signal process system. Multiple constant multiplication technique cannot be directly applied to direct kind and block filtering has large latency due to the collection of partial results making incompatible for transposed form. So this technique provides a way to implement block filtering using MCM by direct form. This method uses common sub-expression sharing algorithm across all multiplications which reduce number of arithmetic operations to calculate inner products. This eventually reduces computational complexity. For this purpose, the coefficient of the filter are encoded by Canonic Signed Digit (CSD) that is used for multiplication. FIR filter supported canonical signed digits illustration of coefficient so as to attenuate the power consumption and quick implementation of the filter. Performance of the proposed filter has been analyzed in terms of its area, power and speed. The look of FIR filter is planned to implement using Xilinx tool.
Multiple Constant Multiplication Technique for Configurable Finite Impulse Response Filter Design

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Index Terms

Computer Science

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Keywords

Multiple constant multiplications (MCM), Canonic Signed Digit (CSD), FIR filter.