Abstract

In this paper, an efficient scheme for detecting and correcting overflow during addition in Residue Number System (RNS) is presented. The approach which is novel to the moduli set \{2^n-1,2^n,2^{n+1}\} is based on the Chinese Remainder Theorem and demonstrates theoretically to be a very fast scheme compared to similar state of the art schemes. The proposed method is able to detect overflow in RNS addition without full reverse conversion; Additionally, the scheme also prevents the representation of wrong numbers as a result of overflow, thus the scheme gives the accurate result without errors whether overflow occurs or not. A comparison, which proves the efficiency of the proposed scheme, in terms of delay and area requirements is also presented.
A Novel RNS Overflow Detection and Correction Algorithm for the Moduli Set \{2^{n-1},2^{n},2^{n+1}\}

Engineering & Technology (IJARCET) Volume 2, Issue 4, April 2013.

- D. Younes and P. Steffan. Universal approaches for overflow and sign detection in residue number system based on \(2^{n}-1,2^{n},2^{n}+1\). The Eighth International Conference on Systems (ICONS 2013), pp. 77 – 84, 2013.

Index Terms

Computer Science Algorithms

Keywords

Residue Number System Chinese Remainder Theorem overflow detection overflow correction moduli set
A Novel RNS Overflow Detection and Correction Algorithm for the Moduli Set \{2^n-1, 2^n, 2^n+1\}