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.

References

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**Index Terms**

Computer Science

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**Keywords**

Residue Number System    Chinese Remainder Theorem    overflow detection

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