Abstract

In this paper, a novel scheme for detecting overflow in Residue Number System (RNS) is presented. A generalized scheme for RNS overflow detection is introduced, followed by a simplified Operands Examination Method for overflow detection for the moduli set \([2^n-1, 2^n, 2^n+1]\). The proposed method detects overflow in RNS addition of two numbers without pre-computing their sum. Moreover, when compared with the best known similar state of the art designs, the proposed scheme requires lesser hardware, reduces the operation size and is faster.

References


Index Terms

Computer Science

Applied Sciences

Keywords

Residue Number System
Overflow Detection
Reverse Converter
Chinese Remainder Theorem

Mixed Radix Conversion