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.


**Index Terms**

Computer Science  
Applied Sciences

**Keywords**

Residue Number System  
Overflow Detection  
Reverse Converter  
Chinese Remainder Theorem  
Mixed Radix Conversion