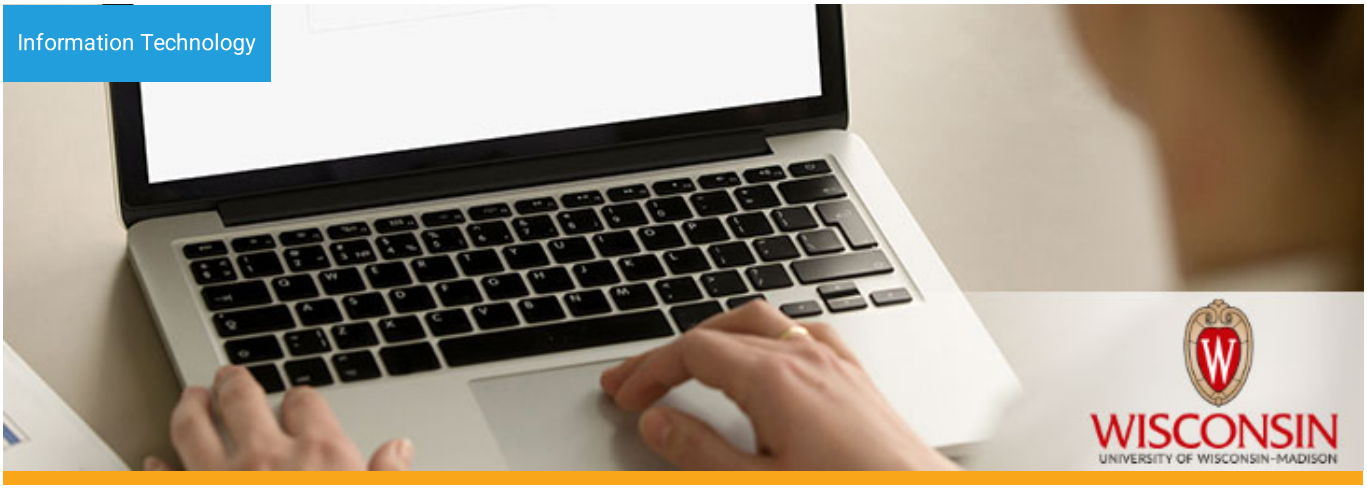
Information Technology



Processing Unit Having Multioperand Decimal Addition

View U.S. Patent No. 7,743,084 in PDF format.

WARF: P04399US

Inventors: Michael Schulte, Robert Kenney

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing methods for rapidly performing decimal addition on multiple binary coded decimal (BCD) operands.

Overview

Most decimal adders add only two numbers at a time. Adding several numbers together takes a long time, because each addition requires carries to propagate.

The Invention

UW-Madison researchers have developed methods for rapidly performing decimal addition on multiple binary coded decimal (BCD) operands. Their discovery uses four techniques, three of which speculate BCD correction values and use a new approach called “chaining” to correct intermediate results. The first technique speculates over one addition, while the second technique speculates over two additions. The third technique uses multiple instances of the first technique in parallel and then merges the results. The fourth technique uses a binary carry-save adder tree and produces a binary sum. Then combinational logic is used to correct the sum and determine the carry into the next digit.

Applications

- Spreadsheet applications for quickly summing large amounts of data
- Especially suited for numerically intensive commercial applications

Key Benefits

- Much faster than current methods
- May improve performance of other arithmetic operations for decimal floating-point numbers

Additional Information

Related Technologies

- See WARF reference number P04245US for a decimal floating-point adder.
- See WARF reference number P04398US for techniques for decimal floating-point division.

Tech Fields

- Information Technology : Computing methods, software & machine learning

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842