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Autore	Deschamps Jean-Pierre <1945->
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Sign-Magnitude Representation; 3.2.2 Excess-E Representation; 3.2.3 B's Complement Representation; 3.2.4 Booth's Encoding; 3.3 Real Numbers; 3.4 Bibliography; 4 Arithmetic Operations: Addition and Subtraction; 4.1 Addition of Natural Numbers; 4.1.1 Basic Algorithm; 4.1.2 Faster Algorithms; 4.1.3 Long-Operand Addition
4.1.4 Multioperand Addition4.1.5 Long-Multioperand Addition; 4.2 Subtraction of Natural Numbers; 4.3 Integers; 4.3.1 B's Complement Addition; 4.3.2 B's Complement Sign Change; 4.3.3 B's Complement Subtraction; 4.3.4 B's Complement Overflow Detection; 4.3.5 Excess-E Addition and Subtraction; 4.3.6 Sign-Magnitude Addition and Subtraction; 4.4 Bibliography; 5 Arithmetic Operations: Multiplication; 5.1 Natural Numbers Multiplication; 5.1.1 Introduction; 5.1.2 Shift and Add Algorithms; 5.1.2.1 Shift and Add 1; 5.1.2.2 Shift and Add 2; 5.1.2.3 Extended Shift and Add Algorithm: XY + C + D
5.1.2.4 Cellular Shift and Add5.1.3 Long-Operand Algorithm; 5.2 Integers; 5.2.1 B's Complement Multiplication; 5.2.1.1 Mod B(n+m) B's Complement Multiplication; 5.2.1.2 Signed Shift and Add; 5.2.1.3 Postcorrection B's Complement Multiplication; 5.2.2 Postcorrection 2's Complement Multiplication; 5.2.3 Booth Multiplication for Binary Numbers; 5.2.3.1 Booth-r Algorithms; 5.2.3.2 Per Gelosia Signed-Digit Algorithm; 5.2.4 Booth Multiplication for Base-B Numbers (Booth-r Algorithm in Base B); 5.3 Squaring; 5.3.1 Base-B Squaring; 5.3.1.1 Cellular Carry-Save Squaring Algorithm; 5.3.2 Base-2 Squaring
5.4 Bibliography6 Arithmetic Operations: Division; 6.1 Natural Numbers; 6.2 Integers; 6.2.1 General Algorithm; 6.2.2 Restoring Division Algorithm; 6.2.3 Base-2 Nonrestoring Division Algorithm; 6.2.4 SRT Radix-2 Division; 6.2.5 SRT Radix-2 Division with Stored-Carry Encoding; 6.2.6 P-D Diagram; 6.2.7 SRT-4 Division; 6.2.8 Base-B Nonrestoring Division Algorithm; 6.3 Convergence (Functional Iteration) Algorithms; 6.3.1 Introduction; 6.3.2 Newton-Raphson Iteration Technique; 6.3.3 MacLaurin Expansion-Goldschmidt's Algorithm; 6.4 Bibliography; 7 Other Arithmetic Operations; 7.1 Base Conversion
7.2 Residue Number System Conversion

Sommario/riassunto

A new approach to the study of arithmetic circuitsIn Synthesis of Arithmetic Circuits: FPGA, ASIC and Embedded Systems, the authors take a novel approach of presenting methods and examples for the synthesis of arithmetic circuits that better reflects the needs of today's computer system designers and engineers. Unlike other publications that limit discussion to arithmetic units for general-purpose computers, this text features a practical focus on embedded systems. Following an introductory chapter, the publication is divided into two parts. The first part, Mathematical Aspects