

Table of Contents

13th IEEE Symposium on Computer Arithmetic

Foreword	viii
Dedication	ix
Committees	x
Reviewers.....	xii
Session 1: Arithmetic Circuits	
<i>Chair: George Taylor</i>	
A Radix-8 CMOS S/390 Multiplier.....	2
<i>E. Schwarz, R. Averill III and L. Sigal</i>	
A GaAs 32-Bit Adder	10
<i>A. Beaumont-Smith and N. Burgess</i>	
SRT Division Architectures and Implementations	18
<i>D. Harris, S. Oberman and M. Horowitz</i>	
Power-Delay Characteristics of CMOS Multipliers	26
<i>T. Callaway and E. Swartzlander Jr.</i>	
Session 2: Number Systems	
<i>Chair: Israel Koren</i>	
On Radix Representation of Rings	34
<i>A.M. Nielsen and P. Kornerup</i>	
Theory and Applications for a Double-Base Number System	44
<i>V. Dimitrov, G. Jullien and W. Miller</i>	
Session 3: Floating-Point Arithmetic - 1	
<i>Chair: William McAllister</i>	
On the Design of IEEE Compliant Floating Point Units	54
<i>G. Even and W. Paul</i>	
A Priori Worst-Case Error Bounds for Floating-Point Computations	64
<i>W. Krämer</i>	
Session 4: Division, Reciprocation, Multiplication and Exponentiation	
<i>Chair: Milos Ercegovac</i>	
Multiprecision Division on an 8-Bit Processor	74
<i>E. Rice and R. Hughey</i>	
Faithful Interpolation in Reciprocal Tables.....	82
<i>D. Das Sarma and D. Matula</i>	
Exponentiation using Division Chains	92
<i>C. Walter</i>	

Implementing Multiply-Accumulate Operation In Multiplication Time	99
<i>P. Stelling and V. Oklobdzija</i>	
 Session 5: Rotations and Elementary Functions - 1	
<i>Chair: Jeong-A Lee</i>	
CORDIC Vectoring with Arbitrary Target Value	108
<i>T. Lang and E. Antelo</i>	
Fast Rotations: Low-Cost Arithmetic Methods for Orthonormal Rotation.....	116
<i>G. Hekstra and E. Deprettere</i>	
Generating a Power of an Operand by a Table Look-Up and a Multiplication.....	126
<i>N. Takagi</i>	
Towards Correctly Rounded Transcendentals	132
<i>V. Lefèvre, J.-M. Muller and A. Tisserand</i>	
 Session 6: Floating-Point Arithmetic - 2	
<i>Chair: Ted Williams</i>	
Pipelined Packet-Forwarding Floating Point: I. Foundations and a Rounder	140
<i>D. Matula and A. Nielsen</i>	
Pipelined Packet-Forwarding Floating Point: II. An Adder	148
<i>A. Nielsen, D. Matula, C. Lyu and G. Even</i>	
The SNAP Project: Design of Floating Point Arithmetic Units.....	156
<i>S. Oberman, H. Al-Twaijry and M. Flynn</i>	
 Session 7: Elementary Functions - 2	
<i>Chair: Dan Zuras</i>	
Fast Table-Driven Algorithms for Interval Elementary Functions	168
<i>D. Priest</i>	
Symmetric Bipartite Tables for Accurate Function Approximation	175
<i>M. Schulte and J. Stine</i>	
High-Performance Hardware for Function Generation	184
<i>J. Cao and B. Wei</i>	
 Session 8: Complex Arithmetic	
<i>Chair: Renato Stefanelli</i>	
Arithmetic Co-Transformations in the Real and Complex Logarithmic Number Systems	190
<i>M. Arnold, T. Bailey, J. Cowles and M. Winkel</i>	
Real/Complex Reconfigurable Arithmetic Using Redundant Complex Number Systems	200
<i>T. Aoki, H. Amada and T. Higuchi</i>	
Algorithms for Multi-Exponentiation Based on Complex Arithmetic.....	208
<i>V. Dimitrov, G. Jullien and W. Miller</i>	

Session 9: Residue Number Systems, Finite Fields and Cryptography - 1*Chair: Luigi Dadda*

Fraction-Free RNS Algorithms for Solving Linear Systems.....218

*P. Turner*Fast Software Exponentiation in GF(2^K).....225*C. Koç and T. Acar***Session 10: Residue Number Systems, Finite Fields and Cryptography - 2***Chair: Simon Knowles*

An RNS Montgomery Modular Multiplication Algorithm234

J.-C. Bajard, L.-S. Didier and P. Kornerup

Design and Implementation of an RNS Division Algorithm.....240

A. Hiasat and H. Abdel-Aty-Zohdy

Scaled and Unscaled Residue Number System to Binary

Conversion Techniques Using the Core Function250

*N. Burgess***Session 11: Miscellaneous***Chair: Peter Kornerup*

On-the-Fly Algorithms and Sequential Machines260

C. Frougny

The Half-Adder Form and Early Branch Condition Resolution.....266

*D. Lutz and D. Jayasimha*Synchronous Up/Down Counter with Clock Period Independent
of Counter Size274*M. Stan*

A Q-Coder Algorithm With Carry Free Addition282

*G. Cena, P. Montuschi, L. Ciminiera and A. Sanna***Author Index291**