

FINAL PROGRAM

FOURTH IEEE SYMPOSIUM ON COMPUTER ARITHMETIC

October 25-27, 1978
Santa Monica, California, U. S. A.
sponsored by
IEEE Computer Society in cooperation
with the UCLA Computer Science Department

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Miloš D. Ercegovac, University of
California, Los Angeles, U. S. A.

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Tuesday, October 24, 1978 6-9 PM Registration

Wednesday, October 25, 1978

8:00 AM *Registration*

9:00 *Opening Remarks*

- Miloš D. Ercegovac, Symposium Chairman
- Algirdas Avižienis, Program Chairman

Welcome

- Walter J. Karplus, UCLA Computer Science Department Chairman

9:15 SESSION I

Chairman: R. T. Gregory

- 1.1 *Basic Digit Sets for Radix Representation of the Integers*
D. W. Matula
- 1.2 *Exact Arithmetic Using a Variable-Length p-adic Representation*
R. N. Horspool and E. C. R. Hehner
- 1.3 *An Interleaved Rational/Radix Arithmetic System for High-Precision Computations*
K. Hwang and T. P. Chang

10:30 *Coffee*

10:50 SESSION 2

Chairman: W. J. Cody

- 2.1 *A Unified Approach to a Class of Number Systems*
I. Koren and Y. Maliniak
- 2.2 *A Feasibility Analysis of Binary Fixed-Slash and Floating-Slash Number Systems*
D. W. Matula and P. Kornerup *Sacrificing Integers*
- 2.3 *A Feasibility Analysis of Fixed-Slash Rational Arithmetic*
P. Kornerup and D. W. Matula
- 2.4 *A Modified Bi-Imaginary Number System*
A. G. Slekyš and A. Avižienis

12:30 *Luncheon*

2:00 SESSION 3

Chairman: D. W. Matula

- 3.1 *Required Scientific Floating Point Arithmetic*
L. A. Liddiard
- 3.2 *Desirable Floating-Point Arithmetic and Elementary Functions for Numerical Computation*
T. E. Hull
- 3.3 *A Realistic Model for Error Estimates in the Evaluation of Elementary Functions*
K. S. Frankowski
- 3.4 *Some Experiments Using Interval Arithmetic*
E. K. Reuter, J. P. Jeter, J. W. Anderson and B. D. Shriver

3:40 *Coffee*

4:00 Panel Session I

Chairman: W. J. Cody

Is Floating-Point Arithmetic Standardization Possible?

6:30 *No-Host Cocktails*

7:30 *Symposium Dinner*

- Speaker: W. Kahan, UC Berkeley

Thursday, October 26, 1978

9:00 SESSION 4

Chairman: P. Kornerup

- 4.1 *Multivariable Polynomial Processing-Applications to Interpolation*
E. V. Krishnamurthy and H. Venkateswaran
- 4.2 *On Arithmetic Inter-relationships and Hardware Interchangeability of Negabinary and Binary Systems*
D. P. Agrawal
- 4.3 *An Appropriate and Empirical Study of the Distribution of Adder Inputs and Maximum Carry Length Propagation*
O. N. Garcia, H. Glass, and S. C. Haines
- 4.4 *On Modular (2^n+1) Arithmetic Logic*
D. P. Agrawal and T. R. N. Rao

10:40 *Coffee*

11:00 SESSION 5

Chairman: T. C. Chen

- 5.1 *Logical Design of a Redundant Binary Adder*
C. Y. Chow and J. E. Robertson
- 5.2 *Parallel Adders Using Standard PLAs*
A. Weinberger
- 5.3 *A Comparison of Two Approaches to Multi-Operand Binary Addition*
D. E. Atkins and S. C. Ong

12:15 *Luncheon*

2:00 SESSION 6

Chairman: J. E. Robertson

- 6.1 *Multiple Addition of Binary Serial Numbers*
L. Dadda
- 6.2 *High-Speed Multiplication and Multiple Summand Addition*
R. S. Lim
- 6.3 *The Theory and Implementation of High-Radix Division*
D. G. Tan
- 6.4 *Higher Radix On-Line Division*
K. S. Trivedi and J. G. Rusnak

3:40 Coffee

4:00 SESSION 7

Chairman: L. Dadda

- 7.1 *Convergence Guarantee and Improvements for a Hardware Exponential and Logarithm Evaluation Scheme*
C. Wrathall and T. C. Chen
- 7.2 *An On-Line Square Rooting Algorithm*
M. D. Ercegovic
- 7.3 *An Arithmetic Module for Efficient Evaluation of Functions*
M. D. Ercegovic and M. M. Takata
- 7.4 *Two Methods for Fast Integer Binary - BCD Conversion*
F. A. Schreiber and R. Stefanelli

Friday, October 27, 1978

9:00 SESSION 8

Chairman: E. V. Krishnamurthy

- 8.1 *Arithmetic Circuit Fault Detection by Modular Encoding*
A. Svoboda
- 8.2 *Application of the Residue Number System to Computer Processing of Digital Signals*
G. A. Jullien and W. C. Miller
- 8.3 *Mathematical Approach to Iterative Computation Networks*
D. Cohen
- 8.4 *Merged Arithmetic for Signal Processing*
E. E. Swartzlander, Jr.

10:40 Coffee

11:00

SESSION 9 404?

Chairman: B. D. Shriver

- 9.1 *Design of Arithmetic Elements for Burroughs Scientific Processor*
D. D. Gajski and L. P. Rubinfield
- 9.2 *Survey of Arithmetic Integrated Circuits*
S. Waser
- 9.3 *Computational Design Alternatives with Microprocessor-Based Systems*
S. L. Lillevik and P. D. Fisher

2:00

Panel Session II

Chairman: M. Ercegovic

Research Directions and Projects in Computer Arithmetic

3:30 End of Symposium

SCA-4 Special Events

Wednesday, October 25

4:00 PM-PANEL DISCUSSION

"Is Floating-Point Arithmetic Standardization Possible?"

Chairman: *W. J. Cody, Argonne National Laboratory*

Panelists: *T. E. Hull, University of Toronto*

W. Kahan, University of California, Berkeley

C. Kaman, Digital Equipment Corporation

J. F. Palmer, Intel Corporation

A. Riccomi, Texas Instruments, Inc.

D. Delp, Signetics

6:30 PM-NO-HOST COCKTAILS

7:30 PM-SYMPOSIUM BANQUET

- 1) Dinner
- 2) Recognition of *Professor Antonin Svoboda, Guest of Honor*
Professor Ray Redheffer, Department of Mathematics, University of California, Los Angeles
- 3) "Can You Count on Your Calculator?"
Illustrated Lecture, *Professor William Kahan, Department of Electrical Engineering and Computer Science, University of California, Berkeley*

Banquet Tickets at \$15.00 each are available
at the Registration Desk.

Friday, October 27

2:00 PM-PANEL SESSION

"Research Directions and Projects in Computer Arithmetic"

Chairman: *Milos D. Ercegovac, University of California, Los Angeles*

"Concurrent Error Detection in Parallel Computer Systems"

R. S. Lim, NASA-Ames Research Center

"On-Line Algorithms and Their Implementation"

M. J. Irwin, Pennsylvania State University

"DELTA - A General Purpose Language for Algorithm Development"
with demonstrations

C. Satten, University of California, Los Angeles