A Rule-Based Expert System for Optimizing Combinational Logic
Aari J. de Geus and William Cohen
Socrates performs substitutions of equivalent gate configurations, thus reducing the overall area of implementation and improving the speed of the design. In some implementations, it performs as well as some human experts.

The VLSI Design Automation Assistant: from Algorithms to Silicon
T. J. Kowalski, D. J. Geiger, W. H. Wolf, and W. Fichtner
This approach to solving the VLSI automation problem breaks the IC design process into stages capitalizing on the advantages inherent in both knowledge-based expert systems and algorithmic approaches.

A Knowledge-Based System for Designing Testable VLSI Chips
Magdy S. Abadir and Melvin H. Breuer
Many techniques have evolved for designing testable circuits. What has been missing is a methodology for evaluating these techniques and a set of criteria for choosing the best one.

MIND: An Inside Look at an Expert System for Electronic Diagnosis
A. Jessie Wilkinson
An expert system that combines hierarchical system design and artificial intelligence techniques. Mind provides an efficient way to test complex VLSI systems.

Natural-Language Interaction for CAD - A First Step
Tariq Samad and Stephen W. Director
Cleopatra, a user interface for CAD, is based on a new approach to natural-language understanding that emphasizes flexibility, parallelism, and redundancy. Cleopatra can handle sentence constructions that have been beyond the scope of most previous natural-language interfaces.

Generation of a Precise Binary Logarithm with Difference Grouping
H. Y. Lo and Y. Aoki

Retargeting the VAX-11/780
Microarchitecture for IEEE Floating-Point Arithmetic - Implementation
Issues, Measurements, and Analysis
D. B. Aspinwall and Y. N. Patt

VLSI Architectures for Computing Multiplications and Inverses in GF(2^m)
C. C. Wang, T. K. Truong, H. M. Shao, L. J. Deutsch, J. K. Omura, and J. S. Reed

Self-Implicating Structures for Diagnosable Systems
A. T. Dahbura, G. M. Masson, and C. L. Yang

Square-Rooting Algorithms for High-Speed Digital Circuits
S. Majerski

Synchronizing Large VLSI Processor Arrays
A. I. Fisher and H. T. Kung

Correspondence

"A Fast Serial-Parallel Binary Multiplier" - R. Gnanasekaran;
"General Model for Memory Interference in Multiprocessors and Mean Value Analysis" - B. Smialauer;
"Ensuring Fault Tolerance of Phase-Locked Clocks" - C. M. Krishna, K. G. Shin, and R. W. Butler; "Note on a Proposed Test for Random Number Generators" - G. Marsaglia;

Continued on p. 106

IEEE TRANSACTIONS ON COMPUTERS
Vol. C-34, No. 8, August 1985
(Monthly) Nonmembers, $152/yr;
Members, $115/yr.

IEEE Design & Test of Computers
Vol. 2, No. 4, August 1985 (Bi-
monthly) Nonmembers, $93/yr.;
Members, $12/yr.

Guest Editor's Introduction: Artificial Intelligence in Design and Test
Donald Thomas

COMPUTERS
August 1985
Evaluation of special functions is essential in solving a wide range of mathematical and statistical problems. In physics, engineering, applied mathematics and other technical fields, reliable results often depend on accurate, verifiable calculation of special functions.

Now there is a straightforward approach to evaluating special functions in mathematical and statistical FORTRAN programming — SFUN/LIBRARY, one of IMSL’s Natural Resources. SFUN/LIBRARY is a comprehensive selection of user-callable subroutines and function subprograms for use in FORTRAN program development. SFUN/LIBRARY lets you select complete, fully tested routines, with the assurance of IMSL accuracy and reliability.

SFUN/LIBRARY is the most comprehensive resource of its kind, with routines for evaluating gamma functions, Bessel functions, exponential integrals, error functions, trigonometric and hyperbolic functions, and many others. The system features independent single- and double-precision versions of routines. Both versions may be employed in the same program, allowing great flexibility in problem solving, and assuring verifiable results through cross-checking. Many functions also have complex-argument versions.

SFUN/LIBRARY could be the Natural Resource for you. To find out more, return this coupon to: IMSL, NBC Building, 7500 Bellaire Boulevard, Houston, Texas 77036 USA. In the U.S., call toll-free, 1-800-222-IMSL. Outside the U.S. (and in Texas), call (713) 772-1977. Telex: 791923 IMSL INC HOU.

Please send complete technical information about SFUN/LIBRARY.

Name:

Dept.:

Title:

Organization:

Address:

City: State: Code:

Area Code/Phone:

Telex:

Computer Type:

SFUN/LIBRARY is designed for ease of use, with logical, recognizable routine names and highly informative diagnostic error messages. Documentation is clear and thorough, featuring both alphabetic and key-word-in-context indexing.

SFUN/LIBRARY is available for Control Data, Data General, Digital Equipment and IBM mainframes, as well as IBM PCs and compatibles, with the service and product support which have made IMSL a world leader in affordable technical software.

TABLES OF CONTENTS

Continued from p. 105

IEEE TRANSACTIONS ON SOFTWARE ENGINEERING

Vol. SE-11, No. 8, August 1985 (Monthly) Nonmembers, $150/yr.; Members, $16/yr.

Analysis and Design in MSG.84: Formalizing Functional Specifications V. Bertzins and M. Gray


An Approach to User Specification of Interactive Display Interfaces L. J. Bass

Extending State Transition Diagrams for the Specification of Human-Computer Interaction A. I. Wasserman

An Aspect of Aesthetics in Human-Computer Communications: Pretty Windows J. Gait

Experiences with a Feedback Version Development Methodology F. B. Bastani

Transformation and Verification of Office Procedures S. Chang and W. Chu

Toward a Theory of Forward Error Recovery A. Mili

System Structure Analysis: Clustering with Data Bindings D. H. Hutchens and V. R. Basil

The Qualified Function Approach to Analysis of Program Behavior and Performance A. Gabrielian, L. P. McNamee, and D. J. Trawick

Synthesizing Code for Resource Controllers K. Ramamritham

Symbolic Semantics and Program Reduction V. Ambriola, F. Giannotti, D. Pedreschi, and F. Turini


Concise Papers

An Image-Processing Language with Icon-Assisted Navigation S. Chang, E. Jungert, S. Levialdi, G. Tortora, and T. Ichikawa

Copyright©1985 IMSL, Inc. Houston, Texas

Computer