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Include a 50-100 word abstract, a list of index terms (four maximum), and a cover letter giving permission to enter the paper in the Repository (entry in the Repository does not constitute publication).

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R78-4—Ghosh, Sukumar, “Structured Petri Nets” (27 pp., Universität Dortmund, West Germany)

Petri nets are effective tools for modeling the performance of asynchronous concurrent systems. These models are becoming increasingly popular for program verification, operating systems interpretation, and understanding asynchronous network protocol. Liveliness and boundedness are two important criteria in the study of Petri nets. Petri nets are difficult to analyze in general terms. Restricted subclasses, however, have been studied in some detail. This paper discusses necessary and sufficient conditions for the liveliness of a class of modular nets, called structured nets. The hierarchical architecture can be easily utilized to construct arbitrarily large nets, whose liveliness can be exactly ensured using a sequential testing procedure.


A low-power, high-speed, 1-bit full adder circuit is described. The circuit is based on conventional current-mode logic circuit techniques. It is intended for use as a basic element in functional integrated circuit design and is assumed to interface with intrachip signals. The design requires only a conventional ECL power supply (±5V) and is suitable for realization with standard integrated circuit processing. The dynamic response of the adder is estimated for several different propagation delays and power dissipations, ranging from 3.5 nsec and 20.2 mW to 17.8 nsec and 1.6 mW. For all but very high speeds, a power-delay product of 30 pJ appears feasible. The adder has found serial arithmetic applications in digital signal processing and, in particular, digital filtering.


A new fault model is proposed for the purpose of testing programmable logic arrays. It is shown that a test set for all detectable modeled faults detects a wide variety of other faults. A test generation method for single faults is then outlined. Included is a bound on the size of test sets which indicates that test sets are much smaller than would be required by exhaustive testing. Finally, it is shown that many interesting classes of multiple faults are also detected by the test sets.

R78-1—Kim, Kwang Hae, “Optimizing Architectures in Parallel Processing” (268 pp., University of California, Berkeley, California)

This paper investigates optimization aspects in designing and operating a parallel processing system of supercomputing power. Specific subjects studied or results obtained include practical tools for parallelism indication, technical foundation for detecting useful parallelism hidden in parallel programs, a modular architecture for effective parallelism utilization, optimization techniques relevant to machine design, static sequencing and static storage allocation, cost-effective validation of parallel programs, and a scheme for concealing run-time overhead incurred in dynamic optimization.
necessary. An algorithm is developed which can speed up that operation, sometimes by more than an order of magnitude. This is done for an arbitrary base \( r \) and digits of accuracy \( d \).


This paper shows a one-one correspondence between all the regular binary trees with \( n \) internal nodes and certain integer sequences, an algorithm for generating these trees lexicographically, and the ranking function and the corresponding unranking procedure. The study then extends the generating algorithm to \( k \)-ary trees. Relations to existing algorithms are discussed.

R78-10—Tietz, Leon Clemens, "Burst-logic: Design and Analysis of Logic to Perform Arithmetic on Data in the Burst Format" (65 pp., Report No. UUUCDCS-R-77-885, University of Illinois, Urbana, Illinois)

A family of processors has been developed to perform arithmetic on data in the burst format. The common building block of these circuits is a simple finite state machine called the perverted adder (PA) which performs burst addition. The interconnection of PA's in a tree formation with some additional circuitry produces a burst multiplier or divider. A PA CPU has been constructed to demonstrate these PA designs.
WAYNE STATE UNIVERSITY
Assistant, Associate, or Full Professor

The expanding Computer Science department at Wayne State University has several academic positions currently open for Assistant, Associate, or Full Professors. A Ph.D. degree is required. Appointments begin with the Fall Quarter, September 1978. Applications are welcome from those interested in teaching graduate and undergraduate courses and pursuing research in any of the following areas of Computer Science: Artificial Intelligence, Computer Architecture, Data Base Management, Discrete or Continuous Simulation, Operating Systems, Pattern Recognition, Programming Languages, Systems Analysis.

Send letter of interest and resume to:

Professor Seymour J. Wolfson
Computer Science Section
Wayne State University
Detroit, MI 48202
or call (313) 577-2477.

Wayne State University is an affirmative action/equal opportunity employer.

SOUTHERN ILLINOIS UNIVERSITY
AT CARBONDALE

Applications are invited for assistant professor and associate professor faculty positions in the Computer Science Department starting August 15, 1978. Candidates should have a broad competence in Computer Science and a specialty in at least one of the following fields: operating systems, programming languages, computer architecture, information systems. Full participation in the department's undergraduate and graduate programs along with excellence in teaching and research is expected. In the case of the associate professor position, an established research record is required. A Ph.D. will be required as of date of employment.

Applicants should send a resume by February 25, 1978 to:

Faculty Recruitment Committee
Department of Computer Science
Southern Illinois University
Carbondale, Illinois 62901

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Department of Electrical Engineering has immediate opening at the Assistant Professor rank for a person with strong background in Computer Software and Hardware. In addition to teaching Electrical and Computer Engineering courses, the candidate should have a demonstrated ability for developing new Computer Software courses and in research and development activities in the digital Systems Laboratory. PhD or equivalent required, industrial and teaching experience desirable. Send resume to Chairperson, Department of Electrical Engineering, California State University, Los Angeles, CA 90032. Application deadline is February 28, 1978. An Affirmative Action Title IX/Equal Opportunity Employer.

ILLINOIS INSTITUTE OF TECHNOLOGY
COMPUTER SCIENCE DEPARTMENT

Applications are solicited for Professional positions in an expanding department, rank open. Applicants should have both an active research interest in Programming Languages and Systems, or Operating Systems, or Software Engineering, and broad teaching interests encompassing graduate and undergraduate levels. The Department of Computer Science offers Ph.D., M.S., M.S.T., B.S., and B.A. degrees. Send Vita and names of three references to Professor Robert G. Tobey, Department of Computer Science, IIT Center, Chicago, Illinois, 60616.

Illinois Institute of Technology is an equal opportunity/affirmative action employer and actively solicits applications from women and minority group candidates.

UNIVERSITY OF OREGON

The Department of Computer Science expects to have an opening for an Assistant Professor, beginning September 1978. Minimum qualifications include:

1. PhD in Computer Science or closely related discipline.
2. Strong potential for conducting research, preferably in: operating systems, programming languages, data base systems, programming methodology or computer networks.
3. Ability to teach a variety of both graduate and undergraduate courses in Computer Science.

Anyone interested in applying for this position should send a vita and three letters of reference to:

Stephen Hedetniemi, Head
Department of Computer Science
University of Oregon
Eugene, Oregon 97403

The University of Oregon as a Title IX Equal Opportunity/Affirmative Action Employer; strongly encourages women and minorities to apply.

RICE UNIVERSITY

The Department of Electrical Engineering at Rice University has an opening for an Assistant Professor in the area of Computer Science and Engineering to start in August 1978. We are particularly interested in applicants with a background in hardware or software engineering. Applicants should hold a Ph.D. degree. The position will involve graduate and undergraduate teaching as well as the supervision of graduate research. Resumes should be sent to J. B. Pearson, Chairman, Department of Electrical Engineering, Rice University, Houston, Texas 77001. Rice University is an equal opportunity-affirmative action employer.

THE UNIVERSITY OF TEXAS AT DALLAS

One or two computer science faculty positions are available in the Programs in Mathematical Sciences. Research and the ability to teach computer science at the graduate and undergraduate levels and to direct Ph.D. dissertations are required. Candidates in the mainstream of computer science are preferred. Salaries, rank, and starting date flexible. UTD provides opportunities for collaborative activities both within the university system and thriving Dallas-area computer industries. To insure full consideration, applications should be received by March 1, 1978. (Indication of sex and ethnicity for Affirmative Action statistical purposes is requested, but not required.) Resume should be sent to:

Mathematical Sciences and Search Committee

c/o Dr. Alexander L. Clark

Vice President for Academic Affairs

The University of Texas at Dallas

P.O. Box 688

Richardson, Texas 75080

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UNIVERSITY OF CALIFORNIA

SANTA BARBARA

The Department of Electrical Engineering and Computer Science at the University of California, Santa Barbara, expects to have several full and/or part-time openings for temporary, one-year academic appointments for the academic year 1978-79 in the areas of computer science, physical electronics, solid-state devices and electronics, and systems and signal processing. These appointments will typically involve both undergraduate and graduate teaching responsibilities. Appointments will be made in the Visiting Professor series, the Acting Professor series, the Lecturer series, or the (Teaching) Associate series at an appropriate rank and salary level depending on the background and qualifications of the successful candidates. Interested individuals should send their letter of interest and resume to: Professor E. B. Stear, Chairman, Department of Electrical Engineering and Computer Science, University of California, Santa Barbara, CA 93106 prior to 15 April 1978. An Equal Opportunity/Affirmative Action Employer.

The School of Engineering, Oakland University, invites applications for faculty positions in Computer Science. Preferred areas are:

- Minicomputers and microcomputers, operating systems and systems software; programming languages, formal language theory and compiler design; data base management and information systems; pattern recognition; software engineering; computer hardware and architecture.

Starting date, August 15, 1978. Duties include undergraduate and graduate teaching and research. Interest in sponsored research activities essential. Doctorate required. Rank and salary commensurate with qualifications. Send resume to Dean, School of Engineering, Oakland University, Rochester, Michigan 48063. Oakland University is an equal opportunity affirmative action employer.

THE UNIVERSITY OF TEXAS AT ARLINGTON

Applications for faculty positions in Computer Science and Engineering at The University of Texas at Arlington are now being considered for fall 1978 and spring 1979. An engineering background with a doctorate in computer science or engineering is desired. Applicants should be able to teach and perform research in hardware or software engineering. To: Dr. Roger S. Walker, Computer Science and Engineering, The University of Texas at Arlington, Arlington, Texas 76019. The University of Texas at Arlington is an Equal Opportunity/Affirmative Action Employer.

MARINE SENIOR SCIENTIST—(position #18)—$21,000 annually. Requires a Ph.D. in Computer Science or closely related field or equivalent experience with 2 years experience in ecological and scientific research. Experience in development, design and implementation of data base systems highly desirable. Specific duties include but are not limited to:

(a) Providing consulting services in statistics and computer science for all Scientists and Departments in the Institute.

(b) Providing experimental design advice and screening all research projects for proper statistical and computer design, and

(c) Coordinating computer and statistical services within the Institute and with other State and Federal Agencies, and

(d) Maintaining and overseeing scientific and business data base systems of the Institute.

Send all applications, letters, or resumes to: Virginia Institute of Marine Science Personnel Office

Gloucester Point, Virginia 23062

Computer Editor: Major New York City professional publisher requires individual with EE Degree and experience in computer industry. Position requires organized thinker, self-starter, able to meet deadlines in reporting, researching, writing and editing for international publication, IEEE SPECTRUM. We offer salary commensurate with experience and liberal benefits package. Please send resume with salary requirements to Mr. E. G. Logan, Personnel Manager, The Institute of Electrical and Electronic Engineers, Inc., 345 E. 47th Street, N.Y., N.Y. 10017. Equal Opportunity Employer M/F/H.

FACULTY POSITIONS

IN COMPUTER SCIENCE

Applications are invited from recent Ph.D. or D.Sc. graduates interested in applying computer science and engineering to the design of asynchronous multiprocessor systems and high-performance information systems. Excellent teaching and research opportunities in an expanding department. For more information reply to:

Computer Science Department

WASHINGTON UNIVERSITY

St. Louis, MO 63130

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January 1978
FACULTY POSITION IN COMPUTER SCIENCE

Applications are invited for a full-time appointment at the senior associate or, possibly, full professor level to begin in the spring of 1978. Applicants should have a Ph.D. in computer science (or in a closely related area) and a demonstrated teaching and research background in this discipline. Preferred areas of specialization are theory of computation, mini and microcomputer systems and applications, and system simulation and optimization. In view of the University's bilingual (French/English) character, candidates should either be bilingual, or be prepared to acquire some competence in both languages. Applicants may also indicate a desire to be considered for the chairmanship of the Department. A current Curriculum Vitae including the names of three references should be sent to L. G. Brita, Chairman, Department of Computer Science, University of Ottawa, Ottawa, Ontario K1N 6N5.

Faculty Position: SUNY College at Brockport. Applications are invited for a permanent position starting in September, 1978. Candidates should have a Ph.D., commitment to Computer Science education, research interests in computer science, and expertise in operating systems, computer architecture, data base methods, or programming language design. Rank and salary open and competitive. Send resume and three references to: Computer Science Search Committee, State University College, Brockport, New York, 14420. Deadline: March 1. (An affirmative action/equal opportunity employer.)

ASSISTANT PROFESSOR OF ELECTRICAL ENGINEERING

Applications are invited for a faculty appointment at the Assistant Professor level starting September 1978. Candidates should have a broad competence within the digital systems discipline and a strong design automation background and be committed to teaching and curriculum development. Send base salary and names of at least 3 references to:

Ms. Frances Cornell
California Employment Development Dept.
449 Sherman Street
Palo Alto, CA 94306

This is an equal opportunity/affirmative action employer and we actively solicit applications from women and minority group candidates.

Head, Department of Electrical Engineering, Stevens Institute of Technology, Hoboken, N.J. Applications are invited for the position of Head of the Department of Electrical Engineering. The applicant must have an earned doctorate in electrical engineering (concentration in computer science/digital systems) and demonstrated ability in teaching and research. Administrative, industrial, or governmental experience is desirable. Stevens is an equal employment/affirmative action employer. Applications and resumes of qualified individuals should be sent to Prof. Alfred C. Gilmore, Jr., Chairman, Search Committee, Department of Electrical Engineering, Stevens Institute of Technology, Castle Point Station, Hoboken, N.J. 07030.

Oregon State University has positions open for graduate assistants in the Department of Computer Science starting in September 1978. Requires baccalaureate in computer science, creditable academic record, admission to the Graduate School, and a sincere interest in teaching or research. Salary is competitive. Please arrange for three qualified references on technical competence, and send complete resume to Dr. W. S. Bregar, Graduate Advisor, Dept. of Computer Science, Oregon State University, Corvallis, Oregon 97331. Oregon State University is an Affirmative Action/Equal Opportunity Employer and complies with Section 504 of the Rehabilitation Act of 1973.

ASSISTANT PROFESSORSHIPS OF COMPUTER SCIENCE

Massachusetts Institute of Technology

The M.I.T. Department of Electrical Engineering and Computer Science has several positions available starting September, 1978 or earlier for superior candidates interested in teaching and research. Candidates from all areas of specialization within computer science will be considered. The Department has special interest in candidates in the hardware and computer systems areas. Research would probably be performed within the Laboratory for Computer Science (formerly Project MAC), the Artificial Intelligence Laboratory, or the Research Laboratory for Electronics. Applications should include a curriculum vitae, and names and addresses of three or more references. Non-U.S. citizens should include an explanation of visa status. Additional material describing the applicant's work, such as papers or technical reports, and a one-paragraph statement of future research plans would be helpful. Send applications to:

Professor Albert R. Meyer
Chairman, Computer Science Search Committee
M.I.T., 545 Technology Square, Room 515
Cambridge, MA 02139

M.I.T. is an equal opportunity/affirmative action employer and actively solicits applications from women and minority group candidates.

Associate professor of computer science position open. Tenurable. Candidates must have a strong academic background in theory of computer science, theory of computational complexity, analysis and design of algorithms. Other tenurable positions, previously announced, are available at the assistant, associate or full professor level in computer science. Send resume to Prof. Omar Wing, Dept. of Electrical Engineering and Computer Science, Columbia University, New York, N.Y. 10027, by January 31, 1978.

SENIOR FACULTY POSITION IN COMPUTER SCIENCE

Applications are invited from experienced faculty members in computer science to fill an opening at the Professor or Associate Professor rank. Experience in data base systems design, the area of specification of data base systems or multiprocessor design is particularly desirable. This opportunity can lead to a responsible and permanent position in the Department of Computer Science. The position includes excellent opportunities for teaching, research and collaboration in the formation of the Department's future program. For more information reply to:

Department of Computer Science
Washington University
St. Louis, Missouri 63130

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