

AL

# Lecture Notes in Computer Science

Edited by G. Goos and J. Hartmanis

241

---

## Foundations of Software Technology and Theoretical Computer Science

Sixth Conference, New Delhi, India

December 18–20, 1986

Proceedings



FB Mathematik TUD



58344400

Edited by Kesav V. Nori



Springer-Verlag

Berlin Heidelberg New York London Paris Tokyo

Fachbereich Mathematik  
Technische Hochschule Darmstadt  
Bibliothek

Inv.-Nr. B 27 184

# T A B L E O F C O N T E N T S

## Keynote Address

Software Development Graphs A Unifying Concept for Software Development? Dines Bjørner (Technical Univ. of Denmark)	1
---------------------------------------------------------------------------------------------------------------------------	---

## SESSION 1 Software Technology

Concurrent Runtime Checking of Annotated Ada Programs D.S. Rosenblum, S. Sankar, D.C. Luckham (Stanford Univ.)	10
Recovery of Noncurrent Variables in Source-Level Debugging of Optimized Code A. Srivastava (Texas Instruments, Dallas)	36
Automatic Retargetable Code Generation: A New Technique Sanjeev Kumar (TRDDC, Pune) V.M. Malhotra (IIT Kanpur)	57
An Implementation of OBJ2: An Object-Oriented Language for Abstract Program Specification S. Sridhar (Tektronix, Oregon)	81

## SESSION 2 Logic Programming and Functional Programming

Explicit Representation of Terms Defined by Counter Examples J.L. Lassez, K. Marriott (IBM T.J. Watson Research Centre, Yorktown Heights)	96
A Framework for Intelligent Backtracking in Logic Programs Vipin Kumar, Yow-Jian Lin (University of Texas, Austin)	108
A Generalization of Backus' FP Y.V. Srinivas, R. Sangal (IIT Kanpur)	124

Invited Talk

Shortest-Path Motion

C.H. Papadimitriou (Stanford University) 144

SESSION 3 Algorithms

Via Assignment in Single Row Routing

J. Bhaskar, S. Sahni (University of Minnesota) 154

Average-Case Analysis of the Modified Harmonic Algorithm

P. Ramanan, K. Tsuga (University of California,  
Santa Barbara) 177Invited Talk

Covering Minima and Lattice Point Free Convex Bodies

Ravi Kannan (Carnegie-Mellon University)  
László Lovász (Eötvös Lorand University, Budapest) 193SESSION 4 Theory

Binary Decompositions and Acyclic Schemes

V.S. Lakshmanan, C.E. Veni Madhavan (IISc Bangalore) 214

Thin Homogeneous Sets of Factors

D. Beauquier (University of Paris) 239

Irreducible Polynomials over Finite Fields

J. von zur Gathen (University of Toronto) 252

Basis Reduction and Evidence for Transcendence of  
Certain Numbers

Ravi Kannan, L.A. McGeoch (Carnegie-Mellon University) 263

SESSION 5 Distributed Computing

A Characterization of Asynchronous Message-Passing

S.R. Goregaokar (IIT Bombay)  
S. Arun Kumar (TIFR Bombay) 270

Modular Synthesis of Deadlock-Free Control Structures A.K. Datta (Arizona State University, Temple) S. Ghosh (Jadavpur University, Calcutta)	288
Distributed Resource Sharing in Computer Networks I.S. Gopal, P. Kermani (IBM T.J. Watson Research Centre, Yorktown Heights)	319
On Proving Communication Closedness of Distributed Layers R. Gerth (Eindhoven University of Technology, Netherlands) L. Shrira (MIT Cambridge and Technion, Israel)	330
A Distributed Algorithm for Edge-Disjoint Path Problem H. Mohanty (ECIL, Hyderabad) G.P. Bhattacharjee (IIT Kharagpur)	344
<u>SESSION 6 Scheduling</u>	
Scheduling of Hard Real-Time Systems A. Moitra (Cornell University)	362
A Polynomial Approximation Scheme for Machine Scheduling on Uniform Processors: Using the Dual Approximation Approach D.S. Hochbaum (University of California, Berkeley) D.B. Shmoys (MIT Cambridge)	382
<u>Invited Talk</u>	
Connectivity Algorithms Using Rubber-bands László Lovász (Eötvös Lorand University, Budapest)	394
<u>SESSION 7 Complexity</u>	
On Simple and Creative Sets in NP S. Homer (Boston University)	412
Complexity of Sufficient-Completeness D. Kapur, P. Narendran (General Electric Company, Schenectady, NY) H. Zhang (Rensselaer Polytechnic Institute)	426

Sampling a Population with a Semi-Random source U.V. Vazirani (Harvard Univ.) V.V. Vazirani (AT&T Bell Labs)	443
<u>SESSION 8 Parallel Algorithms</u>	
An Optimal Parallel Algorithm for Dynamic Expression Evaluation and its Applications A. Gibbons (University of Warwick) W. Rytter (University of Warwick and Warsaw University)	453
Extension of the Parallel Nested Dissection Algorithm to Path Algebra Problems V. Pan (SUNY, Albany) J. Reif (Harvard University)	470
On Synthesizing Systolic Arrays from Recurrence Equations with Linear Dependencies S.V. Rajopadhye (Univ. of Oregon) S. Purushothaman (Penn. State Univ.) R.M. Fujimoto (Univ. of Utah)	488
An Efficient Parallel Algorithm for Term Matching R.M. Verma, T. Krishnaprasad, I.V. Ramakrishnan (SUNY, Stony Brook)	504
Index of Authors	519