

EZ 128.52, -

# Lecture Notes in Computer Science

Edited by G. Goos and J. Hartmanis

118

---

## Mathematical Foundations of Computer Science 1981

Proceedings, 10th Symposium  
Štrbské Pleso, Czechoslovakia  
August 31 – September 4, 1981



Edited by J. Gruska and M. Chytil



Springer  
Berlin

FB Mathematik TUD



58263788

Fachbereich Mathematik  
Technische Hochschule Darmstadt  
Bibliothek

Inv.-Nr. 3 18 942

v York 1981

# CONTENTS

## INVITED LECTURES

J. L. Bentley and T. Ottman	
The complexity of manipulating hierarchically defined sets of rectangles .....	1
A. P. Ershov	
The transformational machine: theme and variations .....	16
R. Freivalds	
Probabilistic two-way machines .....	33
D. Joseph and P. Young	
A survey of some recent results on computational complexity in weak theories of arithmetic .....	46
B. Korte and R. Schrader	
A survey on oracle techniques .....	61
B. Monien and I. H. Sudborough	
Time and space bounded complexity classes and bandwidth constrained problems .....	78

J. Nešetřil

Representations of graphs by means of products  
and their complexity ..... 94

A. Nijholt

Parsing strategies: a concise survey ..... 103

J. van Leeuwen and M. H. Overmars

The art of dynamizing ..... 121

L. G. Valiant and S. Skyum

Fast parallel computation of polynomials using few  
processors ..... 132

R. Valk

Generalizations of Petri nets ..... 140

## COMMUNICATIONS

H. Alt, K. Mehlhorn and J. I. Munro

Partial match retrieval in implicit data structures ..... 156

H. Andréka, I. Németi and I. Sain

A characterization of Floyd-provable programs ..... 162

E. Astesiano and E. Zucca

Semantics of CSP via translation into CCS ..... 172

H. D. Ehrich	
On realization and implementation .....	271
D. Yu. Grigor'ev	
Multiplicative complexity of a bilinear form over a commutative ring .....	281
P. Hájek	
Making dynamic logic first-order .....	287
J. Hořejš	
Partial interpretations of program schemata .....	296
J. Hromkovič	
Closure properties of the family of languages recognized by one-way two-head deterministic finite state automata ..	304
L. Janiga	
Another hierarchy defined by multihead finite automata ...	314
J. W. Jaromczyk	
An extension of Rabin's complete proof concept .....	321
K. Jensen	
How to find invariants for coloured Petri nets .....	327
H. Jung	
Relationships between probabilistic and deterministic tape complexity .....	339

J. Beauquier and J. Berstel	
More about the "geography" of context-free languages .....	183
J. A. Bergstra, M. Broy, J. V. Tucker and M. Wirsing	
On the power of algebraic specifications .....	193
A. Bertoni, M. Brambilla, G. Mauri and N. Sabadini	
An application of the theory of free partially commutative monoids: asymptotic densities of trace languages .....	205
R. Book, M. Jantzen, B. Monien, C. O'Dúnlaing and C. Wrathall	
On the complexity of word problems in certain Thue systems .....	216
F. J. Brandenburg	
On the transformation of derivation graphs to derivation trees .....	224
A. Brandstädt	
Pushdown automata with restricted use of storage symbols .	234
L. A. Cherkasova and V. E. Kotov	
Structured nets .....	242
R. P. Daley	
Retraceability, repleteness and busy beaver sets .....	252
W. Damm and I. Guessarian	
Combining T and level-N .....	262

A. Kelemenová	
Grammatical levels of the position restricted grammars ...	347
H. C. M. Kleijn and G. Rozenberg	
A general framework for comparing sequential and parallel rewriting .....	360
W. Knödel	
A bin packing algorithm with complexity $O(n \log n)$ and performance 1 in the stochastic limit .....	369
I. Korec	
Codings of nonnegative integers .....	379
V. Koubek and A. Ríha	
The maximum $k$ -flow in a network .....	389
H. J. Kreowski and G. Rozenberg	
On the constructive description of graph languages accepted by finite automata .....	398
H. P. Kriegel and V. K. Vaishnavi	
Weighted multidimensional B-trees used as nearly optimal dynamic dictionaries .....	410
L. Kučera	
Maximum flow in planar networks .....	418
K. Lieberherr	
Probabilistic combinatorial optimization .....	423

F. Meyer auf der Heide

Time-processor trade-offs for universal parallel  
computers ..... 433

J. Pittl

Negative results on the size of deterministic right  
parsers ..... 442

J. Pokorný

Key-equivalence of functional dependency statements  
systems ..... 452

J. Reiterman and V. Trnková

On representation of dynamic algebras with reversion ..... 463

B. Rován

A framework for studying grammars ..... 473

V. Yu. Sazanov

On existence of complete predicate calculus in meta-  
mathematics without exponentiation ..... 483

E. Soisalon-Soininen and D. Wood

On structural similarity of context-free grammars ..... 491

S. Sokołowski

Axioms for the term-wise correctness of programs ..... 499

L. Staiger

Complexity and entropy ..... 508

J. Steiner	
Axiomatic semantics of indirect addressing .....	515
K. Tanaka and Y. Kambayashi	
Testing of join dependency by a modified chase method ....	524
H. Wedde	
A starvation-free solution of the dining philosophers' problem by use of interaction systems .....	534
K. Weihrauch and G. Schäfer	
Admissible representations of effective cpo's .....	544
J. Wiedermann	
Preserving total order in constant expected time .....	554
A. Kanda	
Constructive category theory (No. 1) .....	563
APPENDIX	
INVITED LECTURES	
L. Budach	
Two pebbles don't suffice .....	578