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Logic and Machines: Decision Problems and Complexity

Proceedings of the Symposium "Rekursive Kombinatorik" held from May 23 – 28, 1983 at the Institut für Mathematische Logik und Grundlagenforschung der Universität Münster/Westfalen

Edited by E. Börger, G. Hasenjaeger and D. Rödding

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PREFACE

This volume collects written versions of talks presented to the Symposium on "REKURSIVE KOMBINATORIK" which has been held from May 23 to May 28 at the Institut für mathematische Logik und Grundlagenforschung of the University of Münster in Westfalen.

The papers presented by E.Engeler and C.Lautemann have been published in D.Kozen & E.L.Clark: Logic of Programs (Springer Lecture Notes in Computer Science) resp. in Information Processing Letters, and D. Christodoulakis in "Bericht Nr. 127" of the GMD (Gesellschaft für Mathematik und Datenverarbeitung) R. Oldenbourg Verlag, München, Wien 1980.
The editors regret that thwy have received no contribution to these Proceedings from M. Karpinski and A. Selman.
The two papers by D.Schmidt and V.Sperschneider have been presented by title.

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E.Börger — Dortmund
G.Hasenjaeger — Bonn
D.Rödding — Münster

List of Participants

S.O.Aanderaa, K.Ambos-Spies, A.Blass, E.Börger, H.J.Brämik, A.Brüggemann, B.Buchberger, G.Buntrock, H.-G.Carstens, D.Christodoulakis, V.Claus, D.Cohen, E.Dahlhaus, M.Deutsch, E.Engeler, M.Fürer, E.Grandjean, J.Grollmann, G.Hasenjaeger, U.Hedtstück, G.Henzel, C.Hesse, M.Karpinski, R.Klein, H.Kleine Büning, U.Lattwin, C.Lautemann, J.van Leeuwen, Th.Lettmann, K.Madlener, W.Oberschelp, P.Päppinghaus, L.Priese, P.Pudlák, K.W.Regan, M.M.Richter, D.Rödding, W.Rödding, B.Scarpellini, A.L.Selman, E.Specker, V.Sperschneider, D.Spreen, R.Schätz, B.Schinzel, J.Schulte Mönting, H.Schwichtenberg, J.Tiuryn, H.Volger, I.Wegener, W.Zadrozny.

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A.Blass: Computational complexity and equivalence relations

E.Börger: Spektralproblem and Completeness of Logical Decision Problems

B.Buchberger: The solution of decision problems in polynomial ideal theory based on a critical-pair/completion algorithm

H.G.Carstens/P.Päppinghaus: Extensible algorithms

D.Christodoulakis: Yet another very "small" universal machine

D.E.Cohen: Modular machines as a basis for undecidability and incompleteness

E.Dahlhaus: Reductions to NP-complete problems by interpretations

M.Deutsch: New results in the reduction theory of the Entscheidungsproblem

E.Engeler, Equations in combinatorial algebras

M.Fürer: The computational complexity of the unconstrained limited domino problem (with implications for logical decision problems)

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G.Hasenjaeger: Universal Turing machine (UTM) and Jones-Matijasevich masking

U.Hedtstück: Über die Argumentkomplexität mehrfach transitiver boolescher Funktionnen

M.Karpinski: Satisfiability problem in equational theory of the flowchart

H.Kleine Büning: Small universal Turing machines

C.Lautemann: Two theorems on bounded error probability

J.van Leeuwen: Logic circuits, Boolean functions and VLSI

V.Sperschneider: Recursively enumerable extensions of R_1 by finite functions

W.Oberschelp: Fast parallel algorithms for finding all prime implicants for discrete functions

L.Priese: APA-nets

P.Pudlak: New techniques for proving lower bounds of formula size of Boolean functions

Regan,K.W.: Arithmetical degrees of complexity classes

M.M.Richter: On some efficient proof procedures and the permutation of rules

D.Rödding: Modular decomposition of automata

B.Scarpellini: Complete second order spectra

A.Selman: Scholz's Spectrum Problem: after thirty years

E.Specker: What are we looking for in combinatorics?

D.Spreen: On r.e. inseparability of CPO index sets

J.Tiuryn: Implicit definability of terms by (in) finite sets of equations

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