

## BOOK ANNOUNCEMENTS

S. AMARI and M.A. ARBIB, *Competition and Cooperation in Neural Nets*, Proceedings of the US-Japan Joint Seminar held at Kyoto, Japan, February 15-19, 1982, Lecture Notes in Biomathematics, Vol. 45, S. Levin, Managing Editor (Springer-Verlag, Berlin, Heidelberg, New York, 1982) 441 pp.

*Preface. Participants. I. An Opening Perspective.* S. Amari: Competitive and Cooperative Aspects in Dynamics of Neural Excitation and Self-Organization. *II. Reaction-Diffusion Equations.* P.C. Fife: Sigmoidal Systems and Layer Analysis. G.B. Ermentrout: Asymptotic Behavior of Stationary Homogeneous Neuronal Nets. M. Mimura: Aggregation and Segregation Phenomena in Reaction-Diffusion Equations. *III. Single-Neuron and Stochastic Models.* A.C. Scott: Nerve Pulse Interactions. C. Koch, T. Poggio and V. Torre: Micronetworks in Nerve Cells. S. Sato: Role and Use of Noise in Biological Systems. A.V. Holden: Stochastic, Quantal Membrane Conductances and Neuronal Function. L.M. Ricciardi: Diffusion Approximations and Computational Problems for Single Neurons' Activity. S. Yoshizawa: Periodic Pulse Sequences Generated by an Analog Neuron Model. M. Yamaguti and M. Hata: On a Mathematical Neuron Model. *IV. Oscillations in Neural Networks.* R. Suzuki, S. Majima and H. Tatum: Control of Distributed Neural Oscillators. S. Noguchi and T. Araki: Characteristics of Neural Network with Uniform Structure. *V. Development and Plasticity of the Visual Systems.* K.J. Overton and M.A. Arbib: Systems Matching and Topographic Maps: The Branch-Arrow Model (BAM). K. Toyama and Y. Komatsu: Differential Localization of Plastic Synapses in the Visual Cortex of the Young Kitten: Evidence for Guided Development of the Visual Cortical Networks. R. Sawada and N. Sugie: Self-Organization of Neural Nets with Competitive and Cooperative Interaction. T. Kohonen: A Simple Paradigm for the Self-Organized Formation of Structured Feature Maps. K. Fukushima and S. Miyake: Neocognitron: A Self-Organizing Neural Network Model for a Mechanism of Visual Pattern Recognition. E. Harth: On the Spontaneous Emergence of Neuronal Schemata. S. Grossberg: Associative and Competitive Principles of Learning and Development. *VI. Sensori-Motor Transformations and Learning.* M.A. Arbib: Modelling Neural Mechanisms of Visuomotor Coordination in Frog and Toad. R. Lara, F. Cervantes and M.A. Arbib: Two-Dimensional Model of Retinal-Tectal-Pretectal Interactions for the Control of Prey-Predator Recognition and Size Preference in Amphibia. A. Pellionisz and R. Llinas: Tensor Theory of Brain Function: The Cerebellum as a Space-Time Metric. M. Ito: Mechanisms of Motor Learning. N. Tsukahara and M. Kawato: *Dynamic and Plastic Properties of the Brain Stem Neuronal Networks as the Possible Neuronal Basis of Learning and Memory.*

M. NIELSEN and E.M. SCHMIDT, *Automata, Languages and Programming*, Ninth Colloquium, Aarhus, Denmark, July 1982, Lecture Notes in Computer Science, Vol. 140, G. Goos and J. Hartmanis, editors (Springer-Verlag, Berlin, Heidelberg, New York, 1982) 613 pp.

*R.J.R. Back and H. Mannila:* Locality in modular systems. *M. Ben-Ari:* On-the-fly garbage collection: new algorithms inspired by program proofs. *J.A. Bergstra and J.W. Klop:* Algebraic specifications for parametrized data types with minimal parameter and target algebras. *K.J. Berkling and E. Fehr:* A modification of the  $\lambda$ -calculus as a base for functional programming languages. *P. Berman, J.Y. Halpern and J. Tiuryn:* On the power of nondeterminism in dynamic logic. *A. Bertoni, G. Mauri and N. Sabadini:* Equivalence and membership problems for regular trace languages. *N. Blum:* On the power of chain rules in context free grammars. *F.-J. Brandenburg:* Extended Chomsky-Schützenberger theorems. *L. Cardelli:* Real time agents. *J. Case and C. Lynes:* Machine inductive inference and language identification. *G. Comyn and M. Dauchet:* Approximations of infinitary objects. *K. Culik II and J. Karhumäki:* On text sets and the Ehrenfeucht conjecture. *W. Damm and A.*

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Jacques CALMET, *Eurocam'82*, European Computer Algebra Conference, Marseille, France, April 1982, Lecture Notes in Computer Science, Vol. 144, G. Goos and J. Hartmanis, editors (Springer-Verlag, Berlin, Heidelberg, New York, 1982) 301 pp.

*Preface. Author's index. Introduction.* *A. Schönhage*: Asymptotically fast algorithms for the numerical multiplication and division of polynomials with complex coefficients. *D. Probst and V.S. Alagar*: An adaptive hybrid algorithm for multiplying dense polynomials. *H.M. Möller and B. Buchberger*: The construction of multivariate polynomials with preassigned zeros. *A.K. Lenstra*: Lattices and factorization of polynomials over algebraic number fields. *D. Lazard*: Commutative algebra and computer algebra. *J. Avenhaus and K. Madlener*: The Nielsen reduction as key problem to polynomial algorithms in free groups. *J. Angerer and J. Pilz*: The structure of near-rings of small order. *R. Laue*: Computing double coset representatives for the generation of solvable groups. *M. Pohst*: On the determination of algebraic number fields of given discriminant. *D.R. Musser and Deepak Kapur*: Rewrite rule theory and abstract data type analysis. *M. Bergman*: Algebraic specifications: a constructive methodology in logic programming. *W. Kuchlin*: A theorem-proving approach to the Knuth-Bendix completion algorithm. *L. Sterling, A. Bundy, L. Byrd, R. O'Keefe and B. Silver*: Solving symbolic equations with PRESS. *J. Calmet and R. Loos*: Deterministic versus probabilistic factorization of integral polynomials. *D. Lazard*: On polynomial factorization. *P.S. Wang*: Hacijan's algorithm in VAXIMA: improvements and difficulties. *J.H. Davenport*: The parallel Risch algorithm (I). *F. Mora*: An algorithm to compute the equations of tangent cones. *J.A. van Hulzen*: Computer algebra systems viewed by a notorious user. *P.K.H. Gragert and P.H.M. Kersten*: Implementation of

differential geometric objects and functions with an application to extended Maxwell equations. *L. Hornfeldt*: A sum-substitutor used as trigonometric simplifier. *J.A. Campbell and F. Gardin*: Transformation of an intractable problem into a tractable problem: evaluation of a determinant in several variables. *F. Lamnabhi-Lagarrigue and M. Lamnabhi*: Algebraic computation of the solution of some nonlinear differential equations. *G.E. Collins*: Factorization in cylindrical algebraic decomposition. *D.S. Arnon and S. McCallum*: Cylindrical algebraic decomposition by quantifier elimination. *Z. Lomecky*: Algorithms for the computation of free lattices. *L. Bordoni, A. Colagrossi and A. Miola*: Linear algebraic approach for computing polynomial resultant. *A.C. Norman*: The development of a vector-based algebra system. *J.P. Fitch and J. Marti*: NLARGEing a Z80 microprocessor. *J.A. Padget*: Escaping from intermediate expression swell: a continuing saga. *A.C. Hearn*: REDUCE - A case study in algebra system development. *J. Della Dora, C. Di Crescenzo and E. Tournier*: An algorithm to obtain formal solutions of a linear homogeneous differential equation in an irregular singular point. *J. Smit and J.A. van Hulzen*: Symbolic-numeric methods in microwave technology. *B. Malm*: A program in REDUCE for finding explicit solutions to certain ordinary differential equations. *D. Calude and P. Dufresne*: An application of MACSYMA to nonlinear systems decoupling.

A.J. KFOURY, Robert N. MOLL and Michael A. ARBIB, *A Programming Approach to Computability*, Texts and Monographs in Computer Science, David Gries, editor (Springer-Verlag, New York, Heidelberg, Berlin, 1982) 251 pp.

*Preface. Chapter 1: Introduction.* Partial functions and algorithms. An invitation to computability theory. Diagonalization and the Halting problem. *Chapter 2: The syntax and semantics of while-programs.* The language of while-programs. Macro statements. The computable functions. *Chapter 3: Enumeration and universality of the computable functions.* The effective enumeration of while-programs. Universal functions and interpreters. String-processing functions. Pairing functions. *Chapter 4: Techniques of elementary computability theory.* Algorithmic specifications. The s-m-n theorem. Undecidable problems. *Chapter 5: Program methodology.* An invitation to denotational semantics. Recursive programs. Proof rules for program properties. *Chapter 6: The recursion theorem and properties of enumerations.* The recursion theorem. Model-independent properties of enumerations. *Chapter 7: Computable properties of sets (Part 1).* Recursive and recursively enumerable sets. Indexing the recursively enumerable sets. Gödel's incompleteness theorem. *Chapter 8: Computable properties of sets (Part 2).* Rice's theorem and related results. A classification of sets. *Chapter 9: Alternative approaches to computability.* The Turing characterization. The Kleene characterization. Symbol-manipulation systems and formal languages. *References. Notation index. Author index. Subject index.*