Proceedings of

Grammar Systems Week 2004

Budapest, Hungary, July 5-9, 2004

Edited by

E. Csuhaj-Varjú and Gy. Vaszil

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Erzsébet Csuhaj-Varjú and György Vaszil (Eds.)

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Foreword

Grammar Systems is a well-recognized field of formal language theory providing both syntactic models for describing multi-agent systems at the symbolic level and distributed models of language. The theory has been inspired and influenced by several scientific areas: distributed and decentralized artificial intelligence, distributed and parallel computing, artificial life, molecular computing, robotics, ecology, sociology, etc. Computer networks, parallel and distributed computer architectures, distributed and cooperative text processing, natural language processing are among the candidates for possible applications.

So far approximately four hundred publications have been published in the area, among other things a monograph in 1994, and a chapter of the Handbook of Formal Languages in 1997. Grammar systems was the topic of several Ph.D and M.Sc theses.

The workshop *Grammar Systems Week 2004* is the fifth one in a series of workshops started in 1995 in Mangalia, organized by Gheorghe Păun; the series continued in 1996, by a workshop organized by Erzsébet Csuhaj-Varjú in Budapest. The third workshop was organized by Alica Kelemenová in Brno in 1998, and the fourth one was organized by Rudolf Freund and Franziska Freund in Bad Ischl in 2000.

This volume is the proceedings of the *Grammar Systems Week 2004*, held in Budapest, July 5-9, 2004, under the auspices of the *European Molecular Computing Consortium* (EMCC) and the *IFIP Working Group 1.2 on Descriptional Complexity*. It contains the revised versions of papers presented during the event.

The members of the steering committee of the grammar systems workshops are Erzsébet Csuhaj-Varjú (Budapest, Hungary), Jürgen Dassow (Magdeburg, Germany), Rudolf Freund (Vienna, Austria), Jozef Kelemen (Opava, Czech Republic), Alica Kelemenová (Opava, Czech Republic), and Gheorghe Păun (Bucharest, Romania; Seville, Spain).

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Budapest, September of 2004

Erzsébet Csuhaj-Varjú, György Vaszil,
organizers and editors

Program

Monday, July 5

9.00 - 9.40	Erzsébet Csuhaj-Varjú (Budapest, Hungary): Opening. Grammar systems: Past, present, and future
9.40 - 10.30	Gheorghe Păun, invited speaker (Bucharest, Romania / Sevilla, Spain): Grammar systems vs. membrane computing
10.30 - 11.00	Break
11.00 - 11.40	G. N. Sathana Krishnan, Kamala Krithivasan, invited speaker, Ashish Choudhary (Madras, India): Distributed probabilistic finite automata
11.40 - 12.30	Jozef Kelemen (Opava, Czech Republic / Bratislava, Slovakia): Embodiment - A computational point of view
12.30 - 14.00	Lunch
14.00 -	Discussion session: General issues, descriptional complexity issues

Tuesday, July 6

9.00 - 9.50	Jürgen Dassow, invited speaker (Magdeburg, Germany): On cooperating distributed grammar systems with competence based start and stop conditions
9.50 - 10.40	Henning Bordihn (Potsdam, Germany), Markus Holzer (München, Germany): CD grammar systems as models of distributed problem solving, revisited
10.40 - 11.10	Break
11.10 - 11.40	Bettina Sunckel (Frankfurt am Main, Germany): On metalinear CD grammar systems
11.40 - 12.10	Suna Bensch, Henning Bordihn (Potsdam, Germany): Active symbols in pure systems
12.10 - 12.40	Liliana Cojocaru (Tarragona, Spain): On the time, space and communication complexity of cooperating distributed grammar systems
12.40 - 14.00	Lunch
14.00 -	Discussion session: Linguistic issues, descriptional complexity issues

Tuesday, July 6, continued

14.00 - 14.30	M. Dolores Jiménez López (Tarragona, Spain / Pisa, Italy): What can grammar systems do for linguistics?
14.30 - 14.50	Suna Bensch, Helmut Jürgensen (Potsdam, Germany): Modelling dialogues by grammar systems
19.00 -	Workshop Dinner

Wednesday, July 7

9.00 - 9.50	Alica Kelemenová, Michal Tupý (Opava, Czech Republic): Monocultures and homogeneous environment in eco-grammar systems
9.50 - 10.20	Peter Sebestyén, Petr Sosík (Opava, Czech Republic): Multiple robots in space: An adaptive eco-grammar model
10.20 - 10.50	Break
10.50 - 11.20	Francesco Bernardini, Marian Gheorghe (Sheffield, United Kingdom): Population P systems and grammar systems
11.20 - 11.50	Katalin Lázár (Budapest, Hungary): Eco-grammar systems: An approach to the crawlers' problem
11.50 - 12.20	Liliana Cojocaru (Tarragona, Spain): Parallel communicating pushdown transducer systems
12.20 - 14.00	Lunch
14.00 -	Discussion session: Evolutionary models, eco-grammar systems

Thursday, July 8

9.00 - 9.50	Rudolf Freund, Marion Oswald (Vienna, Austria): Modelling grammar systems by tissue P systems
9.50 - 10.30	A. Arun Prasath, Kamala Krithivasan, invited speaker (Madras, India): Distributed 2-way finite state quantum automata
10.30 - 11.00	Break
11.00 - 11.40	L. Kari (London, Canada), S. Konstantinidis (Halifax, Canada), E. Losseva, P. Sosík, G. Thierrin (London, Canada): DNA involutions and hairpin structures
11.40 - 12.20	Gemma Bel Enguix (Tarragona, Spain / Milan, Italy), M. Dolores Jiménez López (Tarragona, Spain / Pisa, Italy): Explaining language change with membranes
12.20 - 14.00	Lunch
14.00 -	Discussion session: Biocomputing, unconventional models

Friday, July 9

9.00 - 9.40	Henning Bordihn (Potsdam, Germany), György Vaszil (Budapest, Hungary): CD grammar systems with LL(k) conditions
9.40 - 10.10	K. S. Dersanambika, K. Krithivasan, K. G. Subramanian (Madras, India): Simple splicing grammar systems
10.10 - 10.40	Maria Adela Grando, Victor Mitrana (Tarragona, Spain): Can PC grammar systems benefit from concurrent programming?
10.40 - 11.10	Break
11.10 - 11.40	A. Roslin Sagaya Mary (Tarragona, Spain), K. G. Subramanian (Madras, India): Image splicing grammar systems
11.40 - 12.10	Results obtained during the workshop. Closing

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