Special Issue

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Preface

Guest Editor

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The 14th edition of the international conference series Automata and Formal Languages was organized in Szeged, Hungary, between the 27th and 29th of May, 2014. The scientific program contained invited lectures by Arnaud Carayol (Marne-la-Vallée), Markus Holzer (Giessen), Ondrej Klíma (Brno), Christof Löding (Aachen) and Sebastian Maneth (Edinburgh), and the presentations of 21 contributed papers selected by the Programme Committee. The proceedings of the conference appeared as volume 151 of EPTCS.

This special issue contains the expanded versions of 3 invited and 4 contributed papers representing several classical and new topics in the theory of automata and formal languages and related areas. All papers have been rigorously refereed according to the standards of IJFCS. This introduction provides a glimpse into the diverse topics of the papers collected in the special issue.

The invited survey article “From finite automata to regular expressions and back — A summary on descriptonal complexity” by Hermann Gruber and Markus Holzer provides an up-to-date overview of recent results on the descriptonal and computational complexity of transforming finite automata to regular expressions and vice versa. The invited paper “Simplification problems for deterministic push-down automata on infinite words” by Christof Löding gives a summary of recent results on the regularity problem for deterministic pushdown automata on ω -words (ω -DPDA) which also give some insights on the equivalence problem for them. It also contains interesting new results on the descriptonal complexity of ω -DPDA. The equivalence problem of tree transducers has been an area of active research since the late 1970s. The invited article “A survey on decidable equivalence problems for tree transducers” by Sebastian Maneth provides an overview of the area and discusses the solution of the equivalence problem for several important

subclasses of deterministic macro tree transducers. It is the pleasure of the guest editor to thank the authors of all three survey papers for the in depth presentation and analysis of their respective topics.

In their article, “Returning parallel communicating finite automata with communication bounds: Hierarchies, decidabilities, and undecidabilities” Henning Bordihn, Martin Kutrib and Andreas Malcher study systems of communicating deterministic finite automata with restricted amount of communication. They show that infinite, strict hierarchies can be obtained by measuring the number of messages sent. In the article “On determinism and unambiguity of weighted two-way automata”, Vincent Carnino and Sylvain Lombardy study the trade-off between one-way and two-way weighted automata. Among others, they show that over commutative semirings, every unambiguous two-way automaton is equivalent to an unambiguous one-way automaton. The field of combinatorics on words is represented in this special issue by the article “Optimal bounds for the similarity density of the Thue-Morse word overlap-free and $7/3$ -power-free infinite binary words” by Chen Fei Du, Jeffrey Shallit and Arseny M. Shur. They generalize a classical result of Kurt Mahler from 1927. The last paper collected in this special issues is the contribution “The finite index restriction meets hybrid modes in cooperating distributed grammar systems” by Henning Fernau, Rudolf Freund and Markus Holzer. The authors describe a rich lattice structure with respect to the inclusion relation between language families arising in connection with cooperating distributed grammar systems working in hybrid modes and relate hybrid CD grammar systems to programmed grammars of finite index.