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## Descriptive Complexity of Formal Systems

Michal Hospodár, Galina Jirásková, Stavros Konstantinidis

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Stavros Konstantinidis (Eds.)

# Descriptive Complexity of Formal Systems

21st IFIP WG 1.02 International Conference, DCFS 2019  
Košice, Slovakia, July 17–19, 2019  
Proceedings

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# Preface

This volume contains the papers presented at the 21st International Conference on Descriptive Complexity of Formal Systems (DCFS 2019) held in Košice, Slovakia, during July 17–19, 2019. It was jointly organized by the Working Group 1.02 on Descriptive Complexity of the International Federation for Information Processing (IFIP), by the Košice branch of the Mathematical Institute of the Slovak Academy of Sciences, and by the Slovak Artificial Intelligence Society.

The DCFS conference series is an international venue for the dissemination of new results related to all aspects of descriptive complexity, which is a field in computer science that deals with the costs of description of objects in various computational models, such as Turing machines, pushdown automata, finite automata, grammars, and others.

DCFS became an IFIP working conference in 2016, continuing the former Workshop on Descriptive Complexity of Formal Systems, which was a result of merging together two workshop series: Descriptive Complexity of Automata, Grammars and Related Structures (DCAGRS) and Formal Descriptions and Software Reliability (FDSR). DCAGRS was previously held in Magdeburg, Germany (1999), London, Ontario, Canada (2000), and Vienna, Austria (2001). FDSR was previously held in Paderborn, Germany (1998), Boca Raton, Florida, USA (1999), and San Jose, California, USA (2000). These workshops were merged in DCFS 2002 in London, Ontario, Canada, which is regarded as the 4th DCFS. Since 2003, DCFS has been successively held in Budapest, Hungary (2003), London, Ontario, Canada (2004), Como, Italy (2005), Las Cruces, New Mexico, USA (2006), Nový Smokovec, High Tatras, Slovakia (2007), Charlottetown, Prince Edward Island, Canada (2008), Magdeburg, Germany (2009), Saskatoon, Canada (2010), Giessen, Germany (2011), Braga, Portugal (2012), London, Ontario, Canada (2013), Turku, Finland (2014), Waterloo, Ontario, Canada (2015), Bucharest, Romania (2016), Milan, Italy (2017), and Halifax, Nova Scotia, Canada (2018).

The topics of this volume include: finite state transducers, quantum automata theory, state complexity, syntactic complexity, subword complexity, quasi-Polish spaces, tree automata, jumping automata, pushdown automata with constant height, input-driven pushdown automata, simple semi-conditional grammars, and monotone WQOs.

There were 25 submissions from 15 different countries: Algeria, Canada, Chile, Czech Republic, France, Germany, Hungary, India, Italy, Japan, Latvia, Russia, Slovakia, South Korea, and the USA. The submission, single-blind refereeing process, and the collating of the proceedings were supported by the EasyChair conference system. Each submission was reviewed by at least three, and on average 3.1, Program Committee members.

The committee selected 18 papers for presentation at the conference, and publication in this volume. The program also included four invited talks by Rudolf Freund, Jarkko Kari, Benedek Nagy, and Giovanni Pighizzini.

We would like to thank the Program Committee members and the external reviewers for their help in selecting the papers. We are also very grateful to all invited speakers, contributing authors, session chairs, and all the participants for their valuable contributions that helped DCFS 2019 to be a scientifically successful event in a collaborative and friendly atmosphere.

We are also grateful to the editorial staff at Springer, in particular Alfred Hofmann and Anna Kramer, for their guidance and help during the process of publishing this volume, and for supporting the event through publication in the LNCS series.

Last but not least, we would like to thank the conference sponsors for their financial support, and the local Organizing Committee: Peter Mlynárčik and Matúš Palmovský (social program), Ivana Krajňáková and Peter Gurský (financial issues), Viktor Olejár (IT support), Juraj Šebej (conference materials). Everything was always carefully checked and slightly criticized by Jozef Jirásek to whom our sincere gratitude goes as well.

We all are looking forward to the next DCFS in Vienna, Austria.

July 2019

Michal Hospodár  
Galina Jirásková  
Stavros Konstantinidis

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Jarkko Kari  
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Giovanni Pighizzini

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Eastern Mediterranean University, Famagusta, Cyprus  
University of Milan, Italy

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