PREFACE:

DESCRIPTIONAL COMPLEXITY OF FORMAL SYSTEMS 2020

The investigation of the complexity of finite descriptions of infinite objects is the subject of *descriptional complexity*. This field of computer science represents a bridge between different areas such as, for instance, automata theory, formal languages, computational complexity, cryptography, information theory, pattern recognition, computer vision, neural networks, *etc.*

Because of the rapidly growing interest in this area, the International Federation for Information Processing (IFIP) founded the Working Group 1.02 (WG 1.02) on Descriptional Complexity, in 1997.

Since 1999, this group promotes a series of workshops related to this field. Descriptional Complexity of Automata, Grammars and Related Systems (DCAGRS) was held first in Magdeburg (1999) and, after that, in London, Ontario (2000) and Vienna (2001). Formal Descriptions and Software Reliability (FDSR) was held in Paderborn (1998), then in Boca Raton (1999) and San José (2000). In 2001, these two related workshops were merged in the successor workshop Descriptional Complexity of Formal Systems (DCFS), that became an IFIP working conference in 2016. DCFS was previously held in London, Ontario, Canada (2002), Budapest, Hungary (2003), London, Ontario, Canada (2004), Como, Italy (2005), Las Cruces, New Mexico (2006), Nový Smokovec, 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), Halifax, Nova Scotia, Canada (2018) and Košice, Slovakia (2019).

DCFS 2020 was expected to be organized by Rudolf Freund at the TU Vienna as part of the Summer of Formal Languages 2020 in Vienna, Austria. Unfortunately, due to the development of the crisis caused by the COVID-19 pandemic, the conference had to be canceled. However, in order to allow researchers in the area of descriptional complexity to still present their recent results in some form, the DCFS steering committee decided to prepare a volume, in the usual format of conference proceedings, containing papers with new developments in the area, accepted after a standard reviewing process. The volume, which has been published as number 12442 in the Springer series *Lecture Notes in Computer Science*, consists of 19 contributed papers, selected by a committee out of a total of 31 submissions, by a total of 54 authors from 17 countries.

As customary, the DCFS steering committee also decided to prepare a special journal issue, including revised and extended versions of selected papers. The outcome is this volume of the *Journal of Automata, Languages and Combinatorics*, consisting of nine papers that have been accepted after a careful refereeing process.

We would like to thank all the authors of the papers for their interesting and stimulating contributions, all the reviewers for their careful revision work and for the time that they spent on this fundamental activity, and the *Journal of Automata, Languages and Combinatorics* for publishing this volume. A special thank goes to Bianca Truthe and to the editorial office for the support during the preparation of the volume.

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