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Davide Ciucci · Gabriella Pasi
Barbara Vantaggi (Eds.)


Scalable Uncertainty Management

12th International Conference, SUM 2018
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Proceedings

Editors

Davide Ciucci 
University of Milano-Bicocca
Milan
Italy

Barbara Vantaggi 
Sapienza University of Rome
Rome
Italy

Gabriella Pasi 
University of Milano-Bicocca
Milan
Italy

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Preface

The series of annual conferences on Scalable Uncertainty Management (SUM) started in 2007, and it is dedicated to the management of large amounts of complex, uncertain, incomplete, or inconsistent information.

Managing uncertainty and inconsistency has been extensively explored in the field of artificial intelligence and statistics over a number of years. Recently, with the advent of massive amounts of data and knowledge from distributed, heterogeneous, and potentially conflicting sources, there has been an increasing interest in defining and applying formalisms capable of representing and managing uncertain and/or inconsistent data and knowledge. To meet the challenge of representing and manipulating large amounts of uncertain information, researchers draw from a wide range of different methodologies and uncertainty models.

While Bayesian methods remain the default choice in most disciplines, sometimes there is a need for more cautious and flexible approaches, and for more specific handling of incomplete or subjective information.

In fact, during the last fifty years, in areas like decision theory, artificial intelligence, or information processing, numerous approaches extending or orthogonal to the existing theory of probability and statistics have been successfully developed. These new approaches rely, for instance, on imprecise probabilities, fuzzy set theory, rough set theory, ordinal uncertainty representations, or even purely qualitative models.

The International Conference on Scalable Uncertainty Management (SUM) aims to provide a forum for researchers who are working on uncertainty management, in different communities and with different uncertainty models, to meet and exchange ideas. Previous SUM conferences have been held in Washington DC (2007), Naples (2008), Washington DC (2009), Toulouse (2010), Dayton (2011), Marburg (2012), Washington DC (2013), Oxford (2014), Québec City (2015), Nice (2016), and Granada (2017).

This volume contains contributions from the 12th SUM conference, which was held in Milan, Italy, during October 3–5, 2018. The conference attracted 37 submissions, of which 29 were accepted for publication (23 as regular and 6 as short papers) and presentation at the conference, based on peer reviews from three members of the Program Committee or by external reviewers.

In addition, the conference greatly benefited from the invited lectures by three world-leading researchers: Salem Benferhat, University of Artois; Georg Gottlob, University of Oxford; and Dominik Ślezak, University of Warsaw. To further embrace the aim of facilitating interdisciplinary collaboration and cross-fertilization of ideas, and building on the tradition of invited speakers at SUM, the conference featured eight tutorials, covering a broad set of topics related to uncertainty management. We thank Hassan Aït-Kaci, Didier Dubois, Salvatore Greco, Francesco Masulli, Agnès Rico, Grégory Smits, Fabio Stella, and Andrea Tettamanzi, for preparing and presenting these tutorials, two of which have a companion paper included in this volume.

We would like to thank all the authors, invited speakers, and tutorial speakers for their valuable contribution, and both the members of the Program Committee and the external reviewers for their detailed and critical assessment of the submissions. We are indebted to the Steering Committee for the suggestions and help given in setting up the conference and to Marco Viviani for his support in the organization. We are also very grateful to the University of Milano-Bicocca for hosting the conference, and to Springer for providing a grant of 500 euros for the best paper awards, and for the support of its staff in publishing this volume.

October 2018

Davide Ciucci
Gabriella Pasi
Barbara Vantaggi

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