

Preface

The 19th International Conference on Discovery Science (DS 2016) was held in Bari, Italy, during October 19–21, 2016. As in previous years, the conference was co-located with the International Conference on Algorithmic Learning Theory (ALT 2016), which was already in its 27th year. First held in 2001, ALT/DS has been one of the longest-running series of co-located events in computer science. The unique combination of latest advances in the development and analysis of methods for discovering scientific knowledge, coming from machine learning, data mining, and intelligent data analysis, as well as their application in various scientific domains, on the one hand, with the algorithmic advances in machine learning theory, on the other hand, made every instance of this joint event unique and attractive. This volume contains the papers presented at the 19th International Conference on Discovery Science, while the papers of the 27th International Conference on Algorithmic Learning Theory were published by Springer in a companion volume (LNCS Vol. 9925).

The 19th Discovery Science conference received 60 international submissions. Each submission was reviewed by at least three committee members. The committee decided to accept 30 papers. This resulted in an acceptance rate of 50 %. Following the tradition of the joint Discovery Science and the Algorithmic Learning Theory conferences, invited talks were shared between the two meetings. There was one shared invited speaker, John Shawe-Taylor from University College London, who contributed his talk “Margin Based Structured Output Learning.” The invited talk for DS 2016 was “Collective Attention on the Web” by Kristian Kersting from the Technical University of Dortmund, while the ALT invited talk was “Learning About Agents and Mechanisms from Opaque Transactions” by Avrim Blum from Carnegie Mellon University. Furthermore, two tutorials, one from ALT and one from DS, were shared. For DS, the tutorial “Perspectives of Feature Selection in Bioinformatics: From Relevance to Causal Inference” was presented by Gianluca Bontempi from the Université Libre de Bruxelles, while for ALT the tutorial “How to Estimate the Mean of a Random Variable?” was given by Gábor Lugosi from Pompeu Fabra University. Abstracts of all five invited talks and tutorials are included in these proceedings.

We would like to thank all the authors of submitted papers, the Program Committee members, and the additional reviewers for their efforts in evaluating the submitted papers, as well as the invited speakers and tutorial presenters. We are grateful to Ronald Ortner and Hans Ulrich Simon for ensuring the smooth coordination with ALT. We would also like to thank all the members of the Organizing Committee: Annalisa Appice, Roberto Corizzo, Claudia d’Amato, Nicola Di Mauro, Stefano Ferilli, Corrado Loglisci, Gianvito Pio, Francesco Serafino. We are grateful to the people behind EasyChair for making the system available free of charge. It was an essential tool in the paper submission and evaluation process, as well as in the preparation of the Springer proceedings. We are also grateful to Springer for their continuing support of Discovery Science and for publishing the conference proceedings. A special issue on the topics of

Discovery Science has also been scheduled for the Springer journal *Machine Learning*, thus offering the possibility of publishing in this prestigious journal an extended and reworked version of papers presented at Discovery Science 2016.

The joint event ALT/DS 2016 was organized under the auspices of the University of Bari “Aldo Moro”. Financial support was generously provided by the Fondazione Puglia and the Consorzio Interuniversitario Nazionale per l’Informatica (National Interuniversity Consortium for Informatics, CINI). The event was also supported by the FP7 project MAESTRA - Learning from Massive, Incompletely annotated, and Structured Data (grant number ICT-2013-612944) from the European Commission.

Finally, we are indebted to all conference participants, who contributed to make this momentous event a worthwhile endeavor for all involved.

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