Joint Proceedings of MedRACER 2018 and WoMoCoE 2018

This volume contains the articles from the workshop on Reasoning with Ambiguous and Conflicting Evidence and Recommendations in Medicine (MedRACER 2018) and the 3rd International Workshop on Ontology Modularity, Contextuality, and Evolution (WOMoCoE 2018), held on 29 october 2018 and co-located with the 16th International Conference on Principles of Knowledge Representation and Reasoning (KR 2018) in Tempe, Arizona.

MedRACER 2018: Reasoning with Ambiguous and Conflicting Evidence and Recommendations in Medicine

Medical reasoning is a complex task as it involves information from multiple sources, interactions among health conditions and medical recommendations and the management of patient and health professional expectations. Incomplete and contradictory information is ever present and decisions have to be made relying on it. Given the harsh environment in which these decisions take place and their potential impacts, mechanisms to support and facilitate them are in high demand. Through computational methods, it is possible to analyse available information, summarise relevant parts, discover conflicts and inconsistencies, and evaluate possible conclusions. They also allow the inclusion in both the representation and reasoning mechanisms of elements reflecting patient needs and preferences from multiple sources (patient, clinician, health center etc.). Thus, exploring computational methods – including defeasible reasoning, computational argumentation, (various forms of) logic programming, ontological inference, machine-interpretable clinical pathways, decision support and recommendation systems, preference-based reasoning – for representation of, reasoning with, and resolving conflicts within, medical knowledge brings forth a positive impact in medical decisions. The MedRACER 2018 workshop brought together researchers from the fields of (various) computational logics, argumentation, defeasible reasoning and reasoning within KR at large, who are interested in health care to share their perspectives on applications of their research to the medical domain. It featured 3 presentations of submitted papers, 1 presentation of an invited paper, and 2 keynote talks, respectively by Francesca Toni and Wlodek Zadrozny. Each submitted paper was reviewed by at least four members of the program committee. Discussed topics included computational argumentation, conflict discovery and resolution, and natural language processing of medical documents. Given the recent recognition of the problems that conflicting and ambiguous information pose to medical reasoning and therefore in computational systems that assist it, MedRACER 2018 is a contribution to the establishment of a community that focuses on the development of computational models to address these problems.

WOMoCoE 2018: Ontology Modularity, Contextuality, and Evolution

In the area of Knowledge representation and reasoning, knowledge is rarely considered as a monolithic and static structure: partitioning knowledge into distinct modular structures is

central to organize knowledge bases, from their design to their management, from their maintenance to their use in knowledge sharing. From a different perspective, representing and reasoning about the context respective to the knowledge in distinct modules is essential for their correct exploitation and for reliable and effective reasoning in changing situations. Finally, evolution of knowledge resources, in terms of updates by newly acquired knowledge, is an important factor influencing the meaningfulness of stored knowledge over time.
The 3rd International Workshop on Ontology Modularity, Contextuality, and Evolution (WOMoCoE 2018) offered a meeting to introduce and discuss works involving such practical and theoretical aspects of modularity, contextuality and evolution of knowledge resources. The workshop aimed to bring together an interdisciplinary audience interested in its topics both from a theoretical and formal point of view and from an applicational perspective. WOMoCoE 2018 program featured the oral presentation of the 3 papers included in this volume. Each submitted paper was reviewed by at least two members of the program committee. The subject and methods of the presented papers range across different workshop topics, in particular ontology partitioning, ontology stratification and conceptual indeterminacy. The workshop program also included a keynote by Thomas Eiter (which abstract is included in this volume) and a closing discussion panel on the topics of the event.

Acknowledgements

We would like to thank all authors of the submitted papers, which introduced new results and discussion topics to the two workshops. We thank the program committee members for their helpful reviews and comments. Moreover, we would like to thank the keynote speakers for the two workshops: Francesca Toni, Wlodek Zadrozny and Thomas Eiter. Finally, we thank the KR 2018 workshop and tutorial chairs, Sebastian Sardina and Ivan Varzinczak for their help and support in organizing the events.

Workshops organization

MedRACER 2018

Workshop chairs

- Kristijonas Čyras, Department of Computing, Imperial College London, UK
- Tiago Oliveira, National Institute of Informatics, Tokyo, Japan
- Matthew Williams, Department of Surgery & Cancer, Imperial College London, UK

Program committee

- Alessio Bottrighi, University Piemonte Orientale
- Annette ten Teije, Vrije Universiteit Amsterdam
- Antonis Kakas, University of Cyprus
- Anthony Hunter, University College London
- Davide Carneiro, Polytechnic Institute of Porto
- Emmanuel Hadoux, University College London
- Erik T Mueller, Intelligent Assistants at Capital One
- Francesca Toni, Imperial College London
- Isabelle Bichindaritz, SUNY Oswego
- Jérémie Dauphin, University of Luxembourg
- John Fox, Deontics Ltd; OpenClinical
- John M Prager, IBM T.J. Watson Research Center
- Ken Satoh, National Institute of Informatics
- Kristijonas Čyras, Imperial College London
- Lisa Chalaguine, University College London
- Matthew Williams, Imperial College London
- Paola Mello, University of Bologna
- Paolo Terenziani, University Piemonte Orientale
- Paolo Torroni, University of Bologna
- Pau Herrero, Imperial College London
- Paulo Novais, University of Minho
- Randy Goebel, University of Alberta
- Ryuta Arisaka, University of Perugia
- Shusaku Tsumoto, Shimane University
- Vicente Julian, Polytechnic University of Valencia
- Tiago Oliveira, National Institute of Informatics

WOMoCoE 2018

Workshop chairs

- Loris Bozzato, Fondazione Bruno Kessler, Trento, Italy
- Martin Homola, Comenius University in Bratislava, Slovakia
- Till Mossakowski, Otto-von-Guericke University Magdeburg, Germany
- Antoine Zimmermann, École des Mines de Saint-Étienne, France

Program committee

- Stefano Borgo, ISTC-CNR, Trento
- Valeria De Paiva, Nuance Communications and University of Birmingham
- Thomas Eiter, Vienna University of Technology
- José M. Giménez-García, Université Jean Monnet Saint-Étienne
- Pascal Hitzler, Wright State University Ohio
- Adila A. Krisnadhi, Universitas Indonesia
- Markus Krötzsch, Dresden University of Technology
- Oliver Kutz, Free University of Bozen/Bolzano
- Maxime Lefrançois, École des Mines de Saint-Étienne
- Rafael Peñaloza, Free University of Bozen/Bolzano
- Daniele Porello, Free University of Bozen/Bolzano
- Thomas Schneider, University of Bremen
- Igor Sedlár, Czech Academy of Sciences
- Luciano Serafini, Fondazione Bruno Kessler, Trento
- Ivor Uhliarik, Comenius University in Bratislava
- George Vouros, University of Piraeus