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Knowledge Representation for Health-Care

AIME 2011 Workshop KR4HC 2011
Bled, Slovenia, July 6, 2011
Revised Selected Papers

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Preface

As computerized health-care support systems are rapidly becoming more knowledge intensive, the representation of medical knowledge in a form that enables reasoning is growing in relevance and taking a more central role in the area of medical informatics. In order to achieve a successful decision-support and knowledge management approach to medical knowledge representation, the scientific community has to provide efficient representations, technologies, and tools to integrate all the important elements that health-care providers work with: electronic health records and health-care information systems, clinical practice guidelines and standardized medical technologies, codification standards, etc.

The workshop on Knowledge Representation for Health Care (KR4HC) is meant to bring together results from different branches of research, all with the aim to contribute on computerized health-care support systems. It is open to contributions showing results from computer science (in particular artificial intelligence), medical informatics and medicine. The third international KR4HC workshop was held in conjunction with the 13th Conference on Artificial Intelligence in Medicine (AIME-2011) at Bled, Slovenia. It aimed at attracting the interest of novel research and advances contributing to the definition, representation and exploitation of health-care knowledge in medical informatics, including both well-founded theoretical works and applications. We received a large number of papers in the area of clinical guidelines and other topics such as health-care processes, electronic patient records and dossiers, medical ontologies, treatment compliance and clinical trials.

Nineteen papers out of twenty-two submissions (86%) were selected to be part of the KR4HC-2011 workshop after a peer review process that involved three expert reviewers per paper. Authors from ten papers (45% of the submitted papers) were invited to give a presentation at the workshop and eight authors (36% of the submitted papers) were invited to present their works as posters. It is remarkable that the authors were from 13 different countries: Austria, Brazil, Canada, France, Germany, Israel, Italy, Luxembourg, The Netherlands, Spain, Sweden, UK and USA.

This book presents 12 selected papers, 11 of which correspond to improved and extended versions of the best papers of KR4HC-2011 and one paper from the invited speaker of the workshop, Yuval Shahar. All the papers underwent a second review round.

The KR4HC workshop series continued a line of successful guideline workshops held in 2000, 2004, 2006, 2007, 2008, and 2009. Following the success of the First European Workshop on Computerized Guidelines and Protocols held at Leipzig, Germany, in 2000, the Symposium on Computerized Guidelines and Protocols (CGP-2004) was organized in Prague, Czech Republic, in 2004. In 2006 an ECAI-2006 workshop at Riva del Garda, Italy, entitled “AI Techniques

in Health-Care: Evidence-Based Guidelines and Protocols” was organized to bring together researchers from different branches of artificial intelligence. This ECAI-2006 workshop continued with a workshop on “Computer-Based Clinical Guidelines and Protocols (CCG-2008)” at the Lorentz Center of Leiden University at the beginning of 2008, which resulted in the book *Computer-Based Clinical Guidelines and Protocols: A Primer and Current Trends* edited by Annette ten Teije, Silvia Miksch, and Peter Lucas and published by IOS Press in 2008.

Running in parallel to the previous ones, there were a series of workshops and publications devoted to the formalization, organization, and deployment of procedural knowledge in health-care. These previous workshops and publications are the IEEE CBMS-2007 special track on “Machine Learning and Management of Health-Care Procedural Knowledge” held in Maribor, Slovenia in 2007; the AIME-2007 workshop entitled “From Medical Knowledge to Global Health-Care” in Amsterdam, The Netherlands, in 2007; the ECAI-2008 workshop on “Knowledge Management for Health-Care Procedures” in Patras, Greece, in 2008, and the Springer books LNAI 4924 and LNAI 5626, both edited by David Riaño in 2008 and 2009, respectively.

These initiatives joined in the first KR4HC workshop that was organized in conjunction with the AIME conference in Verona, Italy, in 2009; the second KR4HC workshop that was organized in conjunction with the ECAI conference in Lisbon, Portugal, in 2010; and the third KR4HC workshop that was organized in conjunction with the AIME conference in Bled, Slovenia, in 2011. Selected and extended papers of KR4HC-2009 and selected papers of KR4HC-2010 resulted in the Springer books LNAI 5943 and LNAI 6512.

Thanks should go to the people who contributed to the KR4HC-2011 workshop: the authors of the submitted papers and the great work of the members of the Program Committee, the participants of the workshop and the sponsoring institutions, the Technische Universität Wien, the Universitat Rovira i Virgili, the Vrije Universeit Amsterdam, and the Diputació de Tarragona.

We aim to organize KR4HC each year in conjunction with a medical informatics or artificial intelligence conference in order to offer a stable platform for the interaction of the community working on knowledge representation for health care.

October 2011

David Riaño
Annette ten Teije
Silvia Miksch

Organization

The Third International Workshop “Knowledge Representation for Health Care” and the edition of this book were organized by David Riaño (Universitat Rovira i Virgili, Tarragona, Spain), Annette ten Teije (Vrije Universiteit Amsterdam, Amsterdam, The Netherlands), and Silvia Miksch (Vienna University of Technology, Vienna, Austria).

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Table of Contents

Health Care Knowledge Sharing

The “Human Cli-Knowme” Project: Building a Universal, Formal, Procedural and Declarative Clinical Knowledge Base, for the Automation of Therapy and Research	1
<i>Yuval Shahar</i>	

Health Processes

A Systematic Analysis of Medical Decisions: How to Store Knowledge and Experience in Decision Tables	23
<i>David Riaño</i>	
Task Network Based Modeling, Dynamic Generation and Adaptive Execution of Patient-Tailored Treatment Plans Based on Smart Process Management Technologies	37
<i>Juan Fdez-Olivares, Inmaculada Sánchez-Garzón, Arturo González-Ferrer, Juan A. Cózar, Ana Fdez-Teijeiro, Manuel R. Cabello, and Luis Castillo</i>	
Towards the Automated Calculation of Clinical Quality Indicators	51
<i>Kathrin Dentler, Annette ten Teije, Ronald Cornet, and Nicolette de Keizer</i>	

Clinical Practice Guidelines

Reasoning with Effects of Clinical Guideline Actions Using OWL: AL Amyloidosis as a Case Study	65
<i>Mor Peleg, Samson W. Tu, Giorgio Leonardi, Silvana Quaglino, Paola Russo, Giovanni Palladini, and Giampaolo Merlini</i>	
Careflow Personalization Services: Concepts and Tool for the Evaluation of Computer-Interpretable Guidelines	80
<i>Rodrigo Bonacin, Cédric Pruski, and Marcos Da Silveira</i>	
Diaflux: A Graphical Language for Computer-Interpretable Guidelines	94
<i>Reinhard Hatko, Joachim Baumeister, Volker Belli, and Frank Puppe</i>	
Analysis of Treatment Compliance of Patients with Diabetes	108
<i>Raphael Bahati, Stacey Guy, and Femida Gwadry-Sridhar</i>	

Patient Records, Ontologies, Medical Costs, and Clinical Trials

Computing Problem Oriented Medical Records	117
<i>Jose M. Juarez, Manuel Campos, Antonio Gomariz, and Antonio Morales</i>	
Detecting Dominant Alternative Interventions to Reduce Treatment Costs	131
<i>Joan Albert López-Vallverdú, David Riaño, and Antoni Collado</i>	
Patterns of Clinical Trial Eligibility Criteria	145
<i>Krystyna Milian, Annette ten Teije, Anca Bucur, and Frank van Harmelen</i>	
Mammographic Knowledge Representation in Description Logic	158
<i>Paul Taylor and Igor Toujilov</i>	
Author Index	171