Web Information Systems and Technologies

9th International Conference, WEBIST 2013 Aachen, Germany, May 8–10, 2013 Revised Selected Papers



Editors Karl-Heinz Krempels RWTH Aachen University Aachen Germany

Alexander Stocker Virtual Vehicle Research Center Graz Austria

ISSN 1865-1348 ISBN 978-3-662-44299-9 DOI 10.1007/978-3-662-44300-2 ISSN 1865-1356 (electronic) ISBN 978-3-662-44300-2 (eBook)

DOI 10.1007/978-3-662-44300-2

Library of Congress Control Number: 2014945218

Springer Heidelberg New York Dordrecht London

© Springer-Verlag Berlin Heidelberg 2014

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

This book includes extended and revised versions of a set of selected papers from WEBIST 2013 (the 9th International Conference on Web Information Systems and Technologies), held in Aachen, Germany, in 2013, which was sponsored by the Institute for Systems and Technologies of Information, Control and Communication (INSTICC) and the German Federal Ministry of Economics and Technology by the grant "econnect Germany – Stadtwerke machen Deutschland elektromobil" (econnect Germany – public utility as electric mobility providers in Germany). This conference was also co-organized by RWTH Aachen University. The conference was held in cooperation with Association for Computing Machinery/Special Interest Group on Management Information Systems (ACM SIGMIS) and technically sponsored by the European Research Center for Information System (ERCIS).

The purpose of the WEBIST series of conferences is to bring together researchers, engineers, and practitioners interested in technological advances and business applications of Web-based information systems. The conference has five main tracks, covering different aspects of Web Information Systems, including Internet Technology, Web Interfaces and Applications, Society, e-Business and e-Government, Web Intelligence and Mobile Information Systems.

The conference program included two specialized tutorials. The first tutorial titled "Cross-Platform App Development: Options and Strategies" was provided by Tim Majchrzak and Hennig Heitkötter, University of Münster, Germany. The second tutorial titled "Usability 101: What Makes Interactive Products Easy to Use – And How to Design Them" focused on human—computer interaction and was provided by Gero Herkenrath, RWTH Aachen University, Germany. Furthermore, the three keynotes provided by Emer Coleman, Harald Schöning, and Brian Donnellan addressed cuttingedge questions in open discussion with the conference members. Emer Coleman, Government Digital Services, UK, addressed "Open Data and Reflections from the London Datastore" in her keynote. Harald Schöning, Software AG, Germany, focused on the big data problem in his keynote titled "See the Wood for the Trees." Last but not least, Brian Donnellan, National University of Ireland, Maynooth, Ireland, discussed "IT and Sustainability" in his keynote.

WEBIST 2013 received 143 paper submissions from 43 countries in all continents. A double-blind review process was enforced, with the help of 190 experts from the international Program Committee, all of them with a PhD in one of the main conference topic areas. From these paper submissions only 27 papers were selected to be published and presented as full papers, i.e., completed work (10 pages in proceedings / 30-min oral presentations) and 30 additional papers, describing work-in-progress as short papers for 20-min oral presentation. Furthermore 29 additional papers were also presented as posters. The full-paper acceptance ratio was 19 %, and the total oral paper acceptance ratio was 39.9 %. The papers included in this book were selected from those with the best reviews also taking into account the quality of their presentation at the

VI Preface

conference, assessed by session chairs. Therefore, we hope that you find these papers interesting, and we trust they may represent a helpful reference for all those who need to address any of the research areas mentioned.

We wish to thank all those who supported and helped to organize the conference. On behalf of the conference Organizing Committee, we would like to thank the authors, whose work mostly contributed to a very successful conference, and the members of the Program Committee, whose expertise and diligence were instrumental in ensuring the quality of the final contributions. We also wish to thank all the members of the Organizing Committee, whose work and commitment was invaluable. Last but not least, we would like to thank Springer for their collaboration in getting this book to print.

December 2013

Karl-Heinz Krempels Alexander Stocker Henrique Gil, Portugal José Antonio Gil, Spain Karl Goeschka, Austria Anna Goy, Italy Ratvinder Grewal, Canada Begoña Gros, Spain William Grosky, USA Anatoliy Gruzd, Canada Francesco Guerra, Italy Aaron Gulliver, Canada Shanmugasundaram Hariharan, India Hamid Harroud, Morocco Ioannis Hatzilygeroudis, Greece A. Henten, Denmark Nicola Henze, Germany Emilio Insfran, Spain Larisa Ismailova, Russian Federation Arun Iyengar, USA Kai Jakobs, Germany Monique Janneck, Germany Ivan Jelinek, Czech Republic Yuh-Jzer Joung, Taiwan Carlos Juiz, Spain Katerina Kabassi, Greece George Karabatis, USA Sokratis Katsikas, Greece Matthias Klusch, Germany In-Young Ko, Republic of Korea Waldemar W. Koczkodaj, Canada Hiroshi Koide, Japan Agnes Koschmider, Germany Karl-Heinz Krempels, Germany Tsvi Kuflik, Israel Peep Kungas, Estonia Greg Leighton, Canada Daniel Lemire, Canada

Stefania Leone, Switzerland Kin Fun Li, Canada Weigang Li, Brazil Xitong Li, USA Dongxi Liu, Australia Ying Liu, Singapore Marti Navarro Llacer, Spain Cristiano Maciel, Brazil Michael Mackay, UK George Magoulas, UK

Zaki Malik, USA Massimo Marchiori, Italy Kazutaka Maruyama, Japan Maristella Matera, Italy Michael Melliar-Smith, USA Ingo Melzer, Germany Emilia Mendes, Brazil Panagiotis Metaxas, USA Tommi Mikkonen, Finland Louise Moser, USA Debajyoti Mukhopadhyay, India Wolfgang Neidl, Germany Stavros Nikolopoulos, Greece Bo Ning, China Alex Norta, Finland Vit Novacek, Ireland Paulo Novais, Portugal Dusica Novakovic, UK Andrea Omicini, Italy Anne-Marie Oostveen, UK Jacco van Ossenbruggen, The Netherlands Jun Pang, Luxembourg Kyparisia Papanikolaou, Greece Eric Pardede, Australia

Kalpdrum Passi, Canada

Viviana Patti, Italy Cesare Pautasso, Switzerland Josef Pieprzyk, Australia Alfonso Pierantonio, Italy Luís Ferreira Pires, The Netherlands

Pierluigi Plebani, Italy Thomas E. Potok, USA Jim Prentzas, Greece Birgit Pröll, Austria

Werner Retschitzegger, Austria Thomas Risse, Germany Thomas Ritz, Germany Gustavo Rossi, Argentina Davide Di Ruscio, Italy Maytham Safar, Kuwait Aziz Salah, Canada Yacine Sam, France Comai Sara, Italy

Anthony Savidis, Greece Bernhard Schandl, Austria

Organization

Conference Chair

Karl-Heinz Krempels RWTH Aachen University, Germany

Program Chair

Alexander Stocker Virtual Vehicle Research Center, Austria

Organizing Committee

Marina Carvalho INSTICC, Portugal Helder Coelhas INSTICC, Portugal INSTICC, Portugal Bruno Encarnação Ana Guerreiro INSTICC, Portugal André Lista INSTICC, Portugal INSTICC, Portugal Andreia Moita Carla Mota INSTICC, Portugal INSTICC, Portugal Raquel Pedrosa Vitor Pedrosa INSTICC, Portugal Susana Ribeiro INSTICC, Portugal Sara Santiago INSTICC, Portugal Mara Silva INSTICC, Portugal José Varela INSTICC, Portugal Pedro Varela INSTICC, Portugal

Program Committee

Josep Domingo-Ferrer, Spain Atilla Elci, Turkey Vadim Ermolayev, Ukraine Larbi Esmahi, Canada Davide Eynard, Switzerland Alexander Felfernig, Austria Anna Fensel, Austria Miriam Fernandez, UK Alberto Fernández, Spain Josep-Lluis Ferrer-Gomila, Spain Filomena Ferrucci, Italy Pasi Fränti, Finland Britta Fuchs, Germany Giovanni Fulantelli, Italy Martin Gaedke, Germany Ombretta Gaggi, Italy John Garofalakis, Greece Irene Garrigos, Spain Panagiotis Germanakos, Cyprus

Massimiliano Giacomin, Italy

Claudio Schifanella, Italy Hamida Seba, France Jochen Seitz, Germany Weiming Shen, Canada Marianna Sigala, Greece Anna Stavrianou, France Alexander Stocker, Austria Giorgos Stoilos, Greece Hussein Suleman, South Africa Jiao Tao, USA Christoph Terwelp, Germany Dirk Thissen, Germany Thanassis Tiropanis, UK Riccardo Torlone, Italy Raquel Trillo, Spain T. Tsiatsos, Greece George Tsihrintzis, Greece

Athina Vakali, Greece Jari Veijalainen, Finland Maria Virvou, Greece Petri Vuorimaa, Finland Mohd. Helmy Abd Wahab, Malaysia Chen Wang, Australia Fan Wang, USA Luyi Wang, USA Jason Whalley, UK Manuel Wimmer, Austria Viacheslav Wolfengagen, Russian Federation Guandong Xu, Australia Yeliz Yesilada, Turkey Daniel Dajun Zeng, USA Christian Zirpins, Germany

Additional Reviewers

Jose Alfonso Aguilar, Mexico Christophe Bobineau, France Paul Bogen, USA Marcin Davies, Austria Paul Heiniz, Germany Oluyomi Kabiawu, South Africa Mehdi Khouja, Spain Vikash Kumar, Austria Isaac Lera, Spain Diego Magro, Italy Christian Samsel, Germany Samir Sebahi, France Cleyton Slaviero, Brazil

Amal Zouaq, Canada

Invited Speakers

Emer Coleman Harald Schöning Brian Donnellan Government Digital Services, UK Software AG, Germany National University of Ireland, Maynooth, Ireland

Contents

Networked XML Compression by Encoding Pre-order Traversals	3
enerating XACML Enforcement Policies for Role-Based Access Control XML Documents	21
Alberto De la Rosa Algarín, Timoteus B. Ziminski, Steven A. Demurjian, Yaira K. Rivera Sánchez, and Robert Kuykendall	
Engineering Flexible Service-Oriented Transactions David Paul and Frans Henskens	37
HTML5 Agents: Mobile Agents for the Web	53
Watermarking Digital Images in the Frequency Domain: Performance and Attack Issues	68
Maria Chroni, Angelos Fylakis, and Stavros D. Nikolopoulos Web Interfaces and Applications	
· · · · · · · · · · · · · · · · · · ·	
Towards a Web of Semantic Tags	87
Web Service Discovery and Execution Using a Dialog-Based Approach Márcio Fuckner, Jean-Paul Barthès, and Edson Emilio Scalabrin	103
Comparison of Mobile Web Frameworks	119
Improving Search Engines' Document Ranking Employing Semantics and an Inference Network	138
Christos Makris, Yannis Plegas, Giannis Tzimas, and Emmanouil Viennas	
Category-Based YouTube Request Pattern Characterization	154

Society, e-Business and e-Government Enhancing the Modularity and Applicability of Web-Based 173 Thomas Lenz, Klaus Stranacher, and Thomas Zefferer Status Quo and Best Practices of App Development in Regional Companies 189 Tim A. Majchrzak and Henning Heitkötter Web Intelligence Vector Space Models for the Classification of Short Messages 209 Ricardo Lage, Peter Dolog, and Martin Leginus FactRunner: A New System for NLP-Based Information Extraction 225 Rhio Sutoyo, Christoph Quix, and Fisnik Kastrati **Mobile Information Systems** Context and Activity Recognition for Personalized Mobile Recommendations... 243 Toon De Pessemier, Simon Dooms, Kris Vanhecke, Bart Matté, Ewout Meyns, and Luc Martens

Author Index

263