Enterprise Information Systems

10th International Conference, ICEIS 2008
Barcelona, Spain, June 12-16, 2008
Revised Selected Papers
Preface

This book contains the best papers of the 10th International Conference on Enterprise Information Systems (ICEIS 2008), held in the city of Barcelona (Spain), organized by the Institute for Systems and Technologies of Information, Control and Communication (INSTICC) in cooperation with AAAI and co-sponsored by WfMC.

ICEIS has become a major point of contact between research scientists, engineers and practitioners in the area of business applications of information systems. This year, five simultaneous tracks were held, covering different aspects related to enterprise computing, including: “Databases and Information Systems Integration,” “Artificial Intelligence and Decision Support Systems,” “Information Systems Analysis and Specification,” “Software Agents and Internet Computing” and “Human–Computer Interaction.” All tracks focused on real-world applications and highlighted the benefits of information systems and technology for industry and services, thus making a bridge between academia and enterprise.

Following the success of 2007, ICEIS 2008 received 665 paper submissions from more than 40 countries. In all, 62 papers were published and presented as full papers, i.e., completed work (8 pages in proceedings / 30-min oral presentations), and 183 papers, reflecting work-in-progress or position papers, were accepted for short presentation and another 161 for poster presentation.

These numbers, leading to a “full-paper” acceptance ratio below 10%, and a total oral paper acceptance ratio below 37%, show the intention of preserving a high-quality forum for the next editions of this conference. Additionally, as usual in the ICEIS conference series, a number of invited talks, presented by internationally recognized specialists in different areas, positively contributed to reinforcing the overall quality of the conference and to providing a deeper understanding of the enterprise information systems field. We included in the first part of this book the set of papers that supported some of these keynote speeches.

The program for this conference required the dedicated effort of many people. Firstly, we must thank the authors, whose research and development efforts are recorded here. Secondly, we thank the members of the Program Committee and the additional reviewers for their diligence and expert reviewing. Thirdly, we thank the invited speakers for their invaluable contribution and for taking the time to synthesize and prepare their talks. Fourthly, we thank the Workshop Chairs and Special Session Chairs whose collaboration with ICEIS was much appreciated. Finally, special thanks to the INSTICC staff whose collaboration was fundamental for the success of this conference.

December 2008

Joaquim Filipe
José Cordeiro
Organization

Conference Chair
Joaquim Filipe Polytechnic Institute of Setúbal / INSTICC Portugal

Program Chair
José Cordeiro Polytechnic Institute of Setúbal / INSTICC, Portugal

Organizing Committee
Paulo Brito INSTICC, Portugal
Marina Carvalho INSTICC, Portugal
Helder Coelhas INSTICC, Portugal
Vera Coelho INSTICC, Portugal
Andreia Costa INSTICC, Portugal
Bruno Encarnação INSTICC, Portugal
Bárbara Lima INSTICC, Portugal
Vitor Pedrosa INSTICC, Portugal
Vera Rosário INSTICC, Portugal
Mónica Saramago INSTICC, Portugal

Senior Program Committee
Luís Amaral, Portugal António Figueiredo, Portugal
Senén Barro, Spain Ulrich Frank, Germany
Jean Bézivin, France Nuno Guimarães, Portugal
Enrique Bonsón, Spain Jatinder Gupta, USA
João Alvaro Carvalho, Portugal Dimitris Karagiannis, Austria
Albert Cheng, USA Michel Leonard, Switzerland
Bernard Coulette, France Kecheng Liu, UK
Jan Dietz, The Netherlands Pericles Loucopoulos, UK
Virginia Dignum, The Netherlands Andrea De Lucia, Italy
Schahram Dustdar, Austria Kalle Lytytinen, USA
Yannis Manolopoulos, Greece
José Legatheaux Martins, Portugal
Masao Johannes Matsumoto, Japan
Luís Moniz Pereira, Portugal
Marcin Paprzycki, Poland
Alain Pirotte, Belgium
Klaus Pohl, Germany
Matthias Rauterberg, The Netherlands
Colette Rolland, France
Narcyz Roztocki, USA
Abdel-Badeeh Salem, Egypt
Bernardette Sharp, UK

Timothy K. Shih, Taiwan
Alexander Smirnov, Russian Federation
Ronald Stamper, UK
David Taniar, Australia
Miguel Toro, Spain
Antonio Vallecillo, Spain
Michalis Vazirgiannis, Greece
François Vernadat, Luxembourg
Ioannis Vlahavas, Greece
Frank Wang, UK
Merrill Warkentin, USA
Hans Weigand, The Netherlands

Program Committee

Mohd Syazwan Abdullah, Malaysia
Rama Akkiraju, USA
Patrick Albers, France
Vasco Amaral, Portugal
Yacine Amirat, France
Andreas Andreou, Cyprus
Plamen Angelov, UK
Pedro Antunes, Portugal
Nasreddine Aoumeur, Germany
Gustavo Arroyo-Figueroa, Mexico
Wudhichai Assawinchaichote, Thailand
Juan Carlos Augusto, UK
Ramazan Aygun, USA
Bart Baesens, UK
Cecilia Baranauskas, Brazil
Steve Barker, UK
Balbir Barn, UK
Daniela Barreiro Claro, Brazil
Nick Bassiliades, Greece
Remi Bastide, France
Nadia Bellalem, France
Orlando Belo, Portugal
Hatem Ben Sta, Tunisia
Sadok Ben Yahia, Tunisia

Manuel F. Bertoa, Spain
Peter Bertok, Australia
Robert Biddle, Canada
Oliver Bittel, Germany
Luis Borges Gouveia, Portugal
Djamel Bouchaffra, USA
Danielle Boulanger, France
Jean-louis Boulanger, France
José Ângelo Braga de Vasconcelos, Portugal
Sjaak Brinkkemper, The Netherlands
Miguel Calejo, Portugal
Coral Calero, Spain
Luis M. Camarinha-Matos, Portugal
Olivier Camp, France
Roy Campbell, USA
Gerardo Canfora, Italy
Fernando Carvalho, Brazil
Nunzio Casalino, Italy
Jose Jesus Castro-Schez, Spain
Luca Cernuzzi, Paraguay
Maria Filomena Cerqueira de Castro Lopes, Portugal
Laurent Chapelier, France
Cindy Chen, USA
Jinjun Chen, Australia
Abdelghani Chibani, France
Henning Christiansen, Denmark
Chrisment Claude, France
Francesco Colace, Italy
Cesar Collazos, Colombia
Jose Eduardo Corcoles, Spain
Antonio Corral, Spain
Ulises Cortes, Spain
Sharon Cox, UK
Alfredo Cuzzocrea, Italy
Mohamed Dahchour, Morocco
Sergio de Cesare, UK
Nuno de Magalhães Ribeiro, Portugal
José-Neuman de Souza, Brazil
Suash Deb, India
Vincenzo Deufemia, Italy
Rajiv Dharaskar, India
Kamil Dimililer, Cyprus
Gillian Dobby, New Zealand
José Javier Dolado, Spain
Anonio Dourado, Portugal
Juan C. Dueñas, Spain
Alan Eardley, UK
Hans-Dieter Ehrich, Germany
Jean-Max Estay, France
Yaniv Eytani, USA
Antonio Fariña, Spain
Antonio Fernández-Caballero, Spain
Edilson Ferneda, Brazil
Paulo Ferreira, Portugal
Filomena Ferrucci, Italy
Juan J. Flores, Mexico
Donal Flynn, UK
Ana Fred, Portugal
Lixin Fu, USA
Mariagrazia Fugini, Italy
Jose A. Gallud, Spain
Juan Garbajosa, Spain
Leonardo Garrido, Mexico
Peter Geczy, Japan
Marcela Genero, Spain
Joseph Giampapa, USA
Paolo Giorgini, Italy
Raúl Giráldez, Spain
Pascual González, Spain
Gustavo Gonzalez-Sanchez, Spain
Robert Goodwin, Australia
Jaap Gordijn, The Netherlands
Silvia Gordillo, Argentina
Feliz Gouveia, Portugal
Virginie Govaere, France
Rune Gustavsson, Sweden
Sven Groppe, Germany
Sissel Guttormsen Schär, Switzerland
Sung Ho Ha, Korea
Maki Habib, Japan
Lamia Hadrich Belguith, Tunisia
Beda Christoph Hammerschmidt, USA
Abdelwahab Hamou-Lhadj, Canada
Thorsten Hampel, Germany
Sven Hartmann, New Zealand
Christian Heinlein, Germany
Ajantha Herath, USA
Suvineetha Herath, USA
Francisco Herrera, Spain
Colin Higgins, UK
Peter Higgins, Australia
Władysław Homenda, Poland
Jun Hong, UK
Wei-Chiang Hong, Taiwan
Nguyen Hong Quang, Vietnam
Jiankun Hu, Australia
Kaiyin Huang, China
Joshua Ignatius, Malaysia
François Jacquenet, France
Hamid Jahankhani, UK
Arturo Jaime, Spain
Ivan Jelinek, Czech Republic
Luis Jiménez Linares, Spain
Paul Johannesson, Sweden
Michail Kologiannakis, France
Nikos Karacapilidis, Greece
Nikitas Karanikolas, Greece
Stamatis Karnouskos, Germany
Hiroyuki Kawano, Japan
Nicolas Kemper Valverde, Mexico
Seungjoo Kim, Korea
Alexander Knapp, Germany
John Krogstie, Norway
Stan Kurkowsky, USA
Rob Kusters, The Netherlands
Joaquín Lasheras, Spain
James P. Lawler, USA
Chul-Hwan Lee, USA
Jintae Lee, USA
Alain Leger, France
Kauko Leiviskä, Finland
Carlos León de Mora, Spain
Joerg Leukel, Germany
Hareton Leung, China
Xue Li, Australia
Therese Libourel, France
John Lim, Singapore
ZongKai Lin, China
Matti Linna, Finland
Panos linos, USA
Honghai Liu, UK
Jan Ljungberg, Sweden
Stephane Loiseau, France
João Correia Lopes, Portugal
Víctor López-Jaquero, Spain
María Dolores Lozano, Spain
Miguel R. Luaces, Spain
Christopher Lueg, Australia
Mark Lycett, UK
Edmundo Madeira, Brazil
Laurent Magnin, Canada
S. Kami Makki, USA
Mirko Malekovic, Croatia
Nuno Mamede, Portugal
João Bosco Mangueira Sobral, Brazil
Pierre Maret, France
Farhi Marir, UK
Maria João Marques Martins, Portugal
Herve Martin, France
Miguel Angel Martinez, Spain
David Martins de Matos, Portugal
Katsuhisa Maruyama, Japan
Hamid Mcheick, Canada
Andreas Meier, Switzerland
Engelbert Mephu Nguifo, France
John Miller, USA
Subhas Misra, USA
Sudip Misra, USA
Michele Missikoff, Italy
Ghodrat Moghadampour, Finland
Pascal Molli, France
Francisco Montero, Spain
Paula Morais, Portugal
Fernando Moreira, Portugal
Nathalie Moreno Vergara, Spain
Gianluca Moro, Italy
Haralambos Mouratidis, UK
Pietro Murano, UK
Tomoharu Nakashima, Japan
Paolo Napoletano, Italy
Ana Neves, Portugal
Jose Angel Olivas, Spain
Luis Olsina Santos, Argentina
Peter Oriogun, UK
Tansel Ozyer, Turkey
Claus Pahl, Ireland
José R. Paramá, Spain
João Pascoal Faria, Portugal
Leif Peterson, USA
Steef Peters, The Netherlands
Vicente Pelechano, Spain
Maria Carmen Penadés Gramaje, Spain
Gabriel Pereira Lopes, Portugal
Laurent Péridy, France
Dana Petcu, Romania
Paolo Petta, Austria
José Pires, Portugal
Geert Poels, Belgium
José Ragot, France
Abdul Razak Rahmat, Malaysia
Jolita Ralyte, Switzerland
Srini Ramaswamy, USA
Pedro Ramos, Portugal
Marek Reformat, Canada
Hajo A. Reijers, The Netherlands
Ulrich Reimer, Switzerland
Marinette Revenu, France
Yacine Rezgui, UK
Simon Richir, France
Roland Ritsch, Switzerland
David Rivreau, France
Daniel Rodriguez, Spain
Pilar Rodriguez, Spain
Jimena Rodriguez Arrieta, Spain
Oscar M. Rodriguez-Elias, Mexico
Jose Raul Romero, Spain
Agostinho Rosa, Portugal
Gustavo Rossi, Argentina
Angel L. Rubio, Spain
Francisco Ruiz, Spain
Roberto Ruiz, Spain
Ángeles S. Places, Spain
Manuel Santos, Portugal
Jurek Sasiadek, Canada

Daniel Schang, France
Mareike Schoop, Germany
Remzi Seker, USA
Isabel Seruca, Portugal
Jianhua Shao, UK
Alberto Silva, Portugal
Maria João Silva Costa Ferreira, Portugal
Spiros Sirmakessis, Greece
Hala Skaf-Molli, France
Pedro Soto-Acosta, Spain
Chantal Soule-Dupuy, France
Priti Srinivas Sajja, India
Chris Stary, Austria
Janis Stirma, Sweden
Markus Stumptner, Australia
Chun-Yi Su, Canada
Vijayan Sugumaran, USA
Lily Sun, UK
Gion K. Svedberg, Sweden
Ramayah T., Malaysia
Ryszard Tadeusiewicz, Poland
Sotirios Terzis, UK
Claudine Toffolon, France
Robert Tolksdorf, Germany
Grigorios Tsoumakas, Greece
Theodoros Tzouramanis, Greece
Gulden Uchyigit, UK
Athina Vakali, Greece
Michael Vassilakopoulos, Greece
Belén Vela Sánchez, Spain
Christine Verdier, France
Maria-Amparo Vila, Spain
HO Tuong Vinh, Vietnam
Aurora Vizcaino, Spain
Bing Wang, UK
Hans Weghorn, Germany
Gerhard Weiss, Austria
Graham Winstanley, UK
Claus Witfelt, Denmark
Wita Wojtkowski, USA
Robert Wrembel, Poland
Baowen Xu, China
Haiping Xu, USA
Hongji Yang, UK
Lili Yang, UK
Jasmine Yeap, Malaysia
Kokou Yetongnon, France
Jun Zhang, China
Liping Zhao, UK
Shuigeng Zhou, China

**Auxiliary Reviewers**

Antonia Albani, The Netherlands
Francisco Martinez Alvarez, Spain
Simona Barresi, UK
Bruno Barroca, Portugal
Christos Berberidis, Greece
Beatriz Pontes Balanza, Spain
Félix Biscarri, Spain
Valeria de Castro, Spain
José María Cavero, Spain
Max Chevalier, France
Evandro de Barros Costa, Brazil
Stergiou Costas, Greece
Guilermo Covella, Argentina
Andrea Delgado, Uruguay
Manuel Fernández Delgado, Spain
Yuhui Deng, China
Remco Dijkman, The Netherlands
Vincent Dubois, France
Beatrice Duval, France
Fausto Fasano, Italy
Paulo Félix, Spain
Oscar Pedreira Fernández, Spain
David Ferreira, Portugal
Rita Francese, Italy
Vittorio Fuccella, Italy
David Heise, Germany
Na Helian, UK
Andi Iskandar, Japan
Nitin Kanaskar, USA
R. B. Lenin, USA

Oriana Licchelli, France
Fernanda Lima, Brazil
Marcos López, Spain
Luiz Mauricio Martins, Portugal
Shamila Makki, USA
Philip Mayer, Germany
Bernardo Mello, Brazil
Germana Menezes da Nóbrega, Brazil
Iñigo Monedero, Spain
Gabriele Monti, Italy
Diego Seco Naveiras, Spain
Rocco Oliveto, Italy
Efi Papatheocharous, Cyprus
Ignazio Passero, Italy
Manuel Lama Penín, Spain
Hércules Antonio do Prado, Brazil
Franck Ravat, France
Michele Risi, Italy
K. Sauvagnat, France
João Saraiva, Portugal
Carlos Senna, Brazil
Ivo dos Santos, Brazil
Ernst Sikora, Germany
Renate Strazdina, Latvia
Xosé Antón Vila Sobrino, Spain
Anastasis Sofkleous, Cyprus
Sithu D. Sudarsan, USA
Jonas Sprenger, Germany
Mehdi Snene, Switzerland
Giuseppe Scanniello, Italy
Constantinos Stylianou, Cyprus
Guilaine Talens, France
Christer Thörn, Sweden
Athanasios Tsadiras, Greece
S. Vimalathithan, USA
Zhiming Wang, USA

Sining Wu, UK
Kenji Yoshigoe, USA
Johannes Zaha, Germany
Chuanlei Zhang, USA
Johannes Zaha, Germany

**Invited Speakers**

Moira C. Norrie
Ricardo Baeza-Yates
Jorge Cardoso
Jean-Marie Favre

ETH Zurich, Switzerland
VP of Yahoo! Research for Europe and LatAm, Spain and Chile
SAP AG, Germany
University of Grenoble, LIG, France
# Table of Contents

## Invited Papers

The Link between Paper and Information Systems .......................... 3  
  *Moira C. Norrie*  

Service Engineering for the Internet of Services ........................... 15  
  *Jorge Cardoso, Konrad Voigt, and Matthias Winkler*  

## Part I: Databases and Information Systems Integration

Bringing the XML and Semantic Web Worlds Closer: Transforming XML into RDF and Embedding XPath into SPARQL ......................... 31  
  *Matthias Droop, Markus Flarer, Jinghua Groppe, Sven Groppe, Volker Linnemann, Jakob Pinggera, Florian Santner, Michael Schier, Felix Schöpf, Hannes Staffler, and Stefan Zugal*  

A Framework for Semi-automatic Data Integration ......................... 46  
  *Paolo Ceravolo, Zhan Cui, Ernesto Damiani, Alex Gusmini, and Marcello Leida*  

Experiences with Industrial Ontology Engineering .......................... 61  
  *Jon Atle Gulla*  

A Semiotic Approach to Quality in Specifications of Software Measures ................................................................. 73  
  *Erki Eessaar*  

Hybrid Computational Models for Software Cost Prediction: An Approach Using Artificial Neural Networks and Genetic Algorithms .... 87  
  *Efi Papatheocharous and Andreas S. Andreou*  

## Part II: Artificial Intelligence and Decision Support Systems

How to Semantically Enhance a Data Mining Process? ....................... 103  
  *Laurent Brisson and Martine Collard*  

Next-Generation Misuse and Anomaly Prevention System .................. 117  
  *Pablo García Bringas and Yoseba K. Penya*
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discovering Multi-perspective Process Models: The Case of Loosely-Structured Processes</td>
<td>130</td>
</tr>
<tr>
<td>Francesco Folino, Gianluigi Greco, Antonella Guzzo, and Luigi Pontieri</td>
<td></td>
</tr>
<tr>
<td>Tackling the Debugging Challenge of Rule Based Systems</td>
<td>144</td>
</tr>
<tr>
<td>Valentin Zacharias</td>
<td></td>
</tr>
<tr>
<td>Semantic Annotation of EPC Models in Engineering Domains to Facilitate an Automated Identification of Common Modelling Practices</td>
<td>155</td>
</tr>
<tr>
<td>Andreas Bögl, Michael Schrefl, Gustav Pomberger, and Norbert Weber</td>
<td></td>
</tr>
<tr>
<td><strong>Part III: Information Systems Analysis and Specification</strong></td>
<td></td>
</tr>
<tr>
<td>Tool Support for the Integration of Light-Weight Ontologies</td>
<td>175</td>
</tr>
<tr>
<td>Thomas Heer, Daniel Retkowitz, and Bodo Kraft</td>
<td></td>
</tr>
<tr>
<td>Business Process Modeling for Non-uniform Work</td>
<td>188</td>
</tr>
<tr>
<td>Kimmo Tarkanen</td>
<td></td>
</tr>
<tr>
<td>Association Rules and Cosine Similarities in Ontology Relationship Learning</td>
<td>201</td>
</tr>
<tr>
<td>Jon Atle Gulla, Terje Brasethvik, and Gøran Sveia Kvarv</td>
<td></td>
</tr>
<tr>
<td>Compositional Model-Checking Verification of Critical Systems</td>
<td>213</td>
</tr>
<tr>
<td>Luis E. Mendoza, Manuel I. Capel, María Pérez, and Kawtar Benghazi</td>
<td></td>
</tr>
<tr>
<td>Model-Driven Web Engineering in the CMS Domain: A Preliminary Research Applying SME</td>
<td>226</td>
</tr>
<tr>
<td>Kevin Vlaanderen, Francisco Valverde, and Oscar Pastor</td>
<td></td>
</tr>
<tr>
<td><strong>Part IV: Software Agents and Internet Computing</strong></td>
<td></td>
</tr>
<tr>
<td>Binary Serialization for Mobile XForms Services</td>
<td>241</td>
</tr>
<tr>
<td>Jaakko Kangasharju and Oskari Koskimies</td>
<td></td>
</tr>
<tr>
<td>An Efficient Neighbourhood Estimation Technique for Making Recommendations</td>
<td>253</td>
</tr>
<tr>
<td>Li-Tung Weng, Yue Xu, Yuefeng Li, and Richi Nayak</td>
<td></td>
</tr>
<tr>
<td>Improve Recommendation Quality with Item Taxonomic Information</td>
<td>265</td>
</tr>
<tr>
<td>Li-Tung Weng, Yue Xu, Yuefeng Li, and Richi Nayak</td>
<td></td>
</tr>
</tbody>
</table>
Adapting Integration Architectures Based on Semantic Web Services to Industrial Needs ........................................ 280
   Daniel Bachlechner

**Part V: Human-Computer Interaction**

“Fact or Fiction?” Imposing Legitimacy for Trustworthy Information on the Web: A Qualitative Inquiry .............................. 297
   Emma Nuraihan Mior Ibrahim, Nor Laila Md. Noor, and Shafie Mehad

Enabling End Users to Proactively Tailor Underspecified, Human-Centric Business Processes: “Programming by Example” of Weakly-Structured Process Models ........................................ 307
   Todor Stoitsev, Stefan Scheidl, Felix Flentge, and Max Mühlhäuser

Enhancing User Experience on the Web via Microformats-Based Recommendations .......................................................... 321
   Anca-Paula Luca and Sabin C. Buraga

Designing Universally Accessible Mobile Multimodal Artefacts .......... 334
   Tiago Reis, Marco de Sá, and Luís Carriço

Dissection of a Visualization On-Demand Server .......................... 348
   Romain Vuillemot, Béatrice Rumpler, and Jean-Marie Pinon

**Author Index** .................................................................................................................. 361