

Lecture Notes in Business Information Processing

310

Series Editors

Wil M. P. van der Aalst

RWTH Aachen University, Aachen, Germany

John Mylopoulos

University of Trento, Trento, Italy

Michael Rosemann

Queensland University of Technology, Brisbane, QLD, Australia

Michael J. Shaw

University of Illinois, Urbana-Champaign, IL, USA

Clemens Szyperski

Microsoft Research, Redmond, WA, USA

More information about this series at <http://www.springer.com/series/7911>

A Min Tjoa · Li-Rong Zheng
Zhuo Zou · Maria Raffai
Li Da Xu · Niina Maarit Novak (Eds.)

Research and Practical Issues of Enterprise Information Systems

11th IFIP WG 8.9 Working Conference, CONFENIS 2017
Shanghai, China, October 18–20, 2017
Revised Selected Papers

Editors

A Min Tjoa
Vienna University of Technology
Vienna
Austria

Li-Rong Zheng
Fudan University
Shanghai
China

Zhuo Zou
Fudan University
Shanghai
China

Maria Raffai
Szechenyi Istvan University
Gyor
Hungary

Li Da Xu
Old Dominion University
Norfolk, VA
USA

Niina Maarit Novak
Vienna University of Technology
Vienna
Austria

ISSN 1865-1348

ISSN 1865-1356 (electronic)

Lecture Notes in Business Information Processing

ISBN 978-3-319-94844-7

ISBN 978-3-319-94845-4 (eBook)

<https://doi.org/10.1007/978-3-319-94845-4>

Library of Congress Control Number: 2018947443

© IFIP International Federation for Information Processing 2018

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.

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.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Springer imprint is published by the registered company Springer International Publishing AG part of Springer Nature

The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

International Conference on Research and Practical Issues of Enterprise Information Systems

11th IFIP WG 8.9 Working Conference, CONFENIS 2017

**Crowne Plaza Fudan, Shanghai, China
October 18–20, 2017**

Preface

The 11th edition of the IFIP WG 8.9 Working Conference, CONFENIS 2017, was held at Crowne Plaza Fudan, in Shanghai, China, during October 18–20, 2017, marking the return of the CONFENIS conference series to China after 10 years (previously CONFENIS was held in Beijing, China, in 2007).

This year’s conference theme – “Industrial Internet of Things and Made in China 2025” – brought together researchers as well as practitioners and representatives of industry, academia, and public authorities to present and discuss latest research ideas and findings with the aim of facilitating the exchange of ideas and developments in all aspects of EIS. In addition, a specialized workshop on the topic of “Smart Electronics and Systems for Industrial IoT” was jointly held with the conference.

The 2017 edition of CONFENIS focused mainly on aspects of EIS concepts, theory and methods, IoT and emerging paradigm, EIS for Industry 4.0, big data analytics, intelligent electronics and systems for industrial IoT. A total of 39 high-quality papers from 19 countries and 42 organizations were received. After a rigorous peer-reviewing process, a total of 17 papers were accepted. We believe that the selected papers will trigger further EIS research and improvements. We express our thanks to the authors for their valuable work and to the Program Committee members for their advice and support. At the same time, we would like to acknowledge the great support by Fudan University and the organization team for their timely contribution and help that made this edition of the conference possible.

Finally, we hope that CONFENIS 2017, as a platform for both academia and industry representatives to discuss the current issues in enterprise information systems, triggered innovative approaches in the different EIS areas.

October 2017

A Min Tjoa
Li-Rong Zheng
Zhuo Zou
Maria Raffai
Li Da Xu
Niina Maarit Novak

Organization

International Conference on Research and Practical Issues of Enterprise Information Systems – CONFENIS 2017

Honorary General Chairs

A Min Tjoa	IFIP TC 8.9 Chair, Vienna University of Technology, Austria
Li Da Xu	IFIP TC 8.9 Founding Chair and Vice Chair, Shanghai Jiao Tong University, China

General Chairs

Li-Rong Zheng	Fudan University, China
Zhuo Zou	Fudan University, China

Program Chairs

Ling Xia Li	Old Dominion University, USA
Maria Raffai	Szechenyi University, Hungary

Program Co-chairs

Hannu Tenhunen (Smart System Track)	KTH Royal Institute of Technology, Sweden
Rose Hannes (Industry Track)	BOSCH, Germany
Yuan Li (EIS Track)	Shanghai Jiao Tong University, China
Tomi Westerlund (IoT Track)	University of Turku, Finland

Publication Chair

Niina Maarit Novak	Vienna University of Technology, Austria
--------------------	--

Program Committee

Liuliu Fu	Tsinghua University, China
Xiaojun Xu	Jilin University, China

Ao Zhang	Jilin University, China
Xiaolin Zhou	Fudan University, China
Yong Chen	Pennsylvania State University, USA
Yang Lu	University of Manchester, UK
Anjee Gorkhali	Tribhuvan University, Nepal
Yongwei Zhong	Fudan University, China

Contents

EIS concepts, Theory and Methods

Modeling of Service Time in Public Organization Based on Business Processes	3
<i>Larisa Bulysheva, Michael Kataev, and Natalia Loseva</i>	
A Behavior Analysis Method Towards Product Quality Management.	12
<i>Congcong Ye, Chun Li, Guoqiang Li, Lihong Jiang, and Hongming Cai</i>	
Method of Domain Specific Code Generation Based on Knowledge Graph for Quantitative Trading.	21
<i>Jianshui Bi, Hongming Cai, Bo Zhou, and Lihong Jiang</i>	
Image Database Management Architecture: Logical Structure and Indexing Methods	34
<i>Larisa Bulysheva, Alexander Bulyshev, and Michael Kataev</i>	

IoT and Emerging Paradigm

Internet of Things or Surveillance of Things?	45
<i>Petr Doucek, Antonin Pavlicek, and Ladislav Luc</i>	
The Economic Value of an Emergency Call System	56
<i>Tomas Lego, Andreas Mladenow, Niina Maarit Novak, and Christine Strauss</i>	
An IoT-Big Data Based Machine Learning Technique for Forecasting Water Requirement in Irrigation Field	67
<i>Fizar Ahmed</i>	

EIS for Industry 4.0

Penetration of Industry 4.0 Principles into ERP Vendors' Products and Services – A Central European Study.	81
<i>Josef Basl</i>	
Systematic Analysis of Future Competences Affected by Industry 4.0	91
<i>András Gábor, Ildikó Szabó, and Fizar Ahmed</i>	
Process-Based Analysis of Digitally Transforming Skills	104
<i>Ildikó Szabó and Katalin Ternai</i>	

Big Data Analytics

Big Data Analytics – Geolocation from the Perspective of Mobile Network Operator 119
Antonin Pavlicek, Petr Doucek, Richard Novák, and Vlasta Strizova

Pattern Discovery from Big Data of Food Sampling Inspections Based on Extreme Learning Machine. 132
Yi Liu, Xin Li, Jianxin Wang, Feng Chen, Junyu Wang, Yiwei Shi, and Lirong Zheng

Big Data Analytics Using SQL: Quo Vadis? 143
K. T. Sridhar

Intelligent Electronics and Systems for Industrial IoT

Rethinking ‘Things’ - Fog Layer Interplay in IoT: A Mobile Code Approach. 159
Behailu Negash, Tomi Westerlund, Pasi Liljeberg, and Hannu Tenhunen

A Security Framework for Fog Networks Based on Role-Based Access Control and Trust Models 168
Farhoud Hosseinpour, Ali Shuja Siddiqui, Juha Plosila, and Hannu Tenhunen

IoT Platform for Real-Time Multichannel ECG Monitoring and Classification with Neural Networks 181
Jose Granados, Tomi Westerlund, Lirong Zheng, and Zhuo Zou

Deep Ensemble Effectively and Efficiently for Vehicle Instance Retrieval . . . 192
Zhengyan Ding, Xiaoteng Zhang, Shaoxi Xu, Lei Song, and Na Duan

Author Index 203