

Lecture Notes in Business Information Processing

244

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Paolo Ceravolo · Stefanie Rinderle-Ma (Eds.)

Data-Driven Process Discovery and Analysis

5th IFIP WG 2.6 International Symposium, SIMPDA 2015
Vienna, Austria, December 9–11, 2015
Revised Selected Papers

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ISSN 1865-1348

ISSN 1865-1356 (electronic)

Lecture Notes in Business Information Processing

ISBN 978-3-319-53434-3

ISBN 978-3-319-53435-0 (eBook)

DOI 10.1007/978-3-319-53435-0

Library of Congress Control Number: 2017930618

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Printed on acid-free paper

This Springer imprint is published by Springer Nature

The registered company is Springer International Publishing AG

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

Preface

The rapid growth of organizational and business processes managed via information systems has made available a big variety of data that consequently created a high demand for making data analysis techniques more effective and valuable. The fifth edition of the International Symposium on Data-driven Process Discovery and Analysis (SIMPDA 2015) was conceived to offer a forum where researchers from different communities and the industry can share their insights in this hot new field. As a symposium, SIMPDA fosters exchanges among academic researchers, industry, and a wider audience interested in process discovery and analysis. The event is organized by the IFIP WG 2.6. This year the symposium was held in Vienna.

Submissions cover theoretical issues related to process representation, discovery, and analysis or provide practical and operational experiences in process discovery and analysis. To improve the quality of the contributions, the symposium fostered discussions during the presentation. Papers are pre-circulated to the authors, who are expected to read them and make ready comments and suggestions. After the event, authors have the opportunity to improve their work extending the presented results. For this reason, authors of accepted papers and keynote speakers were invited to submit extended articles to this post-symposium volume of LNBIP. There were 22 submissions and eight papers were accepted for publication.

During this edition, the presentations and the discussions frequently focused on the adoption of process mining algorithms in conjunction and coordination with other techniques and methodologies. The current selection of papers underlines the most relevant challenges that were identified and proposes novel solutions and approaches facing these challenges.

In the first paper, “A Framework for Safety-Critical Process Management in Engineering Projects,” Saimir Bala et al. present a framework for process management in complex engineering projects that are subject to a large amount of constraints and make use of heterogeneous data sources that must be monitored consistently to indicators and business goals.

The second paper, by Alfredo Bolt et al., is titled “Business Process Reporting Using Process Mining, Analytic Workflows and Process Cubes: A Case Study in Education.” It illustrates in detail a case study where state-of-the-art process-mining techniques are used to periodically produce automated reports that relate the actual performance of students of a Dutch university to their studying behavior. Based on two evaluations, the authors discuss the acceptance level and the quality achieved by reports generated using process mining tools.

The third paper, by Bart Hompes et al., is titled “Detecting Changes in Process Behavior Using Comparative Case Clustering” and presents a novel comparative case-clustering approach that is able to expose changes in behavior. Valuable insights can be gained and process improvements can be made by finding those points in time where behavior changed and the reasons why this happened.

The fourth paper by Parabhakar Dixit et al., “Using Domain Knowledge to Enhance Process Mining Results,” proposes a verification algorithm to verify the presence of certain constraints in a process model. This is particularly relevant when the user has certain domain expertise that should be exploited to create better process models. The outcome of the proposed approach is a Pareto front of process models based on the constraints specified by the domain expert and by common quality dimensions of process mining.

The fifth paper by Stefan Bunk et al., “Aligning Process Model Terminology with Hypernym Relations,” faces the challenge of using a consistent terminology to label the activities of process models. To support this task, the authors defined two techniques to detect specific terminology defects, namely, process hierarchy defects and object hierarchy defects, and give recommendations to align them with hypernym hierarchies.

The sixth paper by Andreas Solt et al., “Time Series Petri Net Models: Enrichment and Prediction,” aims at conciliating time series and Petri net models to provide operational support to predict the performance of individual cases and the overall business process considering seasonal effects.

The seventh paper by Theresia Gschwandtner, “Visual Analytics Meets Process Mining: Challenges and Opportunities,” shows that the combination of visual data exploration with process mining algorithms makes complex information structures more comprehensible and facilitates new insights. Thus, before and during the application of automated analysis methods, such as process mining algorithms, the analyst needs to investigate how visual analytics can integrate a knowledge discovery environment.

The eighth paper by Thomas Vogelgesang and Jurgen Appelrath, “A Relational Data Warehouse for Multidimensional Process Mining,” studies how to implement a relational database supporting OLAP operations for process mining.

We gratefully acknowledge the strong research community that gathered around the research problems related to process data analysis and the high quality of their research work, which is hopefully reflected in the papers of this volume. We would also like to express our deep appreciation of the referees’ hard work and dedication. Above all, thanks are due to the authors for submitting the best results of their work to the Symposium on Data-driven Process Discovery and Analysis.

We are very grateful to the Università degli Studi di Milano and to IFIP for their financial support, and to the University of Vienna and the Austrian Computer Society for hosting the event.

January 2017

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Contents

A Framework for Safety-Critical Process Management in Engineering Projects	1
<i>Saimir Bala, Cristina Cabanillas, Alois Haselböck, Giray Havur, Jan Mendling, Axel Polleres, Simon Sperl, and Simon Steyskal</i>	
Business Process Reporting Using Process Mining, Analytic Workflows and Process Cubes: A Case Study in Education	28
<i>Alfredo Bolt, Massimiliano de Leoni, Wil M.P. van der Aalst, and Pierre Gorissen</i>	
Detecting Changes in Process Behavior Using Comparative Case Clustering	54
<i>B.F.A. Hompes, J.C.A.M. Buijs, Wil M.P. van der Aalst, P.M. Dixit, and J. Buurman</i>	
Using Domain Knowledge to Enhance Process Mining Results.	76
<i>P.M. Dixit, J.C.A.M. Buijs, Wil M.P. van der Aalst, B.F.A. Hompes, and J. Buurman</i>	
Aligning Process Model Terminology with Hypernym Relations.	105
<i>Stefan Bunk, Fabian Pittke, and Jan Mendling</i>	
Time Series Petri Net Models: Enrichment and Prediction	124
<i>Andreas Solti, Laura Vana, and Jan Mendling</i>	
Visual Analytics Meets Process Mining: Challenges and Opportunities	142
<i>Theresia Gschwandtner</i>	
A Relational Data Warehouse for Multidimensional Process Mining	155
<i>Thomas Vogelgesang and H.-Jürgen Appelrath</i>	
Author Index	185