The handle [http://hdl.handle.net/1887/85677](http://hdl.handle.net/1887/85677) holds various files of this Leiden University dissertation.

**Author:** Changizi, B.  
**Title:** Constraint-based analysis of business process models  
**Issue Date:** 2020-02-25
About the author

Behnaz Changizi was born on March 21st, 1979 in Hamedan, Iran. She completed her bachelor studies in Computer Engineering at the Faculty of Computer Engineering Amirkabir University of Technology - Tehran Polytechnic Tehran, Iran, in 2003. She has worked for several years as a software developer before starting a master’s degree. She obtained her master of science in Software Engineering from Sharif University of Technology in 2007. In 2008, Behnaz moved to Amsterdam to become a Ph.D. student at the Leiden University as part of the COMPAS project, under the supervision of Prof. Dr. Farhard Arbab. After four years of being a full-time Ph.D. student, Behnaz returned to industry to follow her passion for creating software, while she continued working on her thesis.
Acknowledgement

I would like to express my gratitude to all the people who helped me in any form during the period of my Ph.D. It is impossible to name everyone here, but I would like to mention some of them.

I would like to thank my colleagues in CWI Jose Proenca, Michiel Helvensteijn, Joost Winter, Ziyan Maraikar, Young-Joo Moon, Lacramioara Astdanac, Helle Hansen, Christian Krause, Mahdi Jaghoori, Sun Meng, Stijn de Gouw, and Sung-Shik Jongmans, Alexandra Silva, Stephanie Kemper, Yunes Hassen, and Ivan Zapreev.

I would like to especially thank Bahareh Changizi for drawing the bird on the thesis cover, Iona Michaelis for editing the last chapter of my thesis, Davey Bruns for editing the Dutch version of my thesis’s summary, and Michiel Helvensteijn for proofreading my thesis.

I give special thanks to my family and friends for lifting me: Bahareh Changizi, Behnam Changizi, Arash Malayeri, Narges Javaheri, Aylar Soltani, Amaneh Mahboubi, Somayeh Balhtari, Martina Chirilus-Bruckner, Naser Ayat, Anna Kovacs, Zaldina Stevic, Pedram Malayeri, and Reinahneh Zolfaghari.

This doctoral dissertation is dedicated to my parents to whom I am forever grateful for their love, support, and encouragement and to my husband Rory Michaelis for his love, support, and patience. He deserves the final acknowledgment as he suffered most from its completion.
Titles in the IPA Dissertation Series since 2017

M.J. Steindorfer. Efficient Immutable Collections. Faculty of Science, UvA. 2017-01


A. Krasnova. Smart invaders of private matters: Privacy of communication on the Internet and in the Internet of Things (IoT). Faculty of Science, Mathematics and Computer Science, RU. 2017-05

A.D. Mehrabi. Data Structures for Analyzing Geometric Data. Faculty of Mathematics and Computer Science, TU/e. 2017-06

D. Landman. Reverse Engineering Source Code: Empirical Studies of Limitations and Opportunities. Faculty of Science, UvA. 2017-07

W. Luks. Security and Privacy via Cryptography – Having your cake and eating it too. Faculty of Science, Mathematics and Computer Science, RU. 2017-08

A.M. Şutu. Modularity and Reuse of Domain-Specific Languages: an exploration with MetaMod. Faculty of Mathematics and Computer Science, TU/e. 2017-09

U. Tikhonova. Engineering the Dynamic Semantics of Domain Specific Languages. Faculty of Mathematics and Computer Science, TU/e. 2017-10

Q.W. Bouts. Geographic Graph Construction and Visualization. Faculty of Mathematics and Computer Science, TU/e. 2017-11


S. Darabi. Verification of Program Parallelization. Faculty of Electrical Engineering, Mathematics & Computer Science, UT. 2018-02

J.R. Salamanca Tellez. Coequations and Eilenberg-type Correspondences. Faculty of Science, Mathematics and Computer Science, RU. 2018-03

P. Fiteru-Broştean. Active Model Learning for the Analysis of Network Protocols. Faculty of Science, Mathematics and Computer Science, RU. 2018-04

D. Zhang. From Concurrent State Machines to Reliable Multi-threaded Java Code. Faculty of Mathematics and Computer Science, TU/e. 2018-05

H. Basold. Mixed Inductive-Coinductive Reasoning Types, Programs and Logic. Faculty of Science, Mathematics and Computer Science, RU. 2018-06

A. Lele. Response Modeling: Model Refinements for Timing Analysis
of Runtime Scheduling in Real-time Streaming Systems. Faculty of Mathematics and Computer Science, TU/e. 2018-07

N. Bezirgiannis. Abstract Behavioral Specification: unifying modeling and programming. Faculty of Mathematics and Natural Sciences, UL. 2018-08

M.P. Konzack. Trajectory Analysis: Bridging Algorithms and Visualization. Faculty of Mathematics and Computer Science, TU/e. 2018-09


L. Swartjes. Model-based design of baggage handling systems. Faculty of Mechanical Engineering, TU/e. 2018-12


R. Kumar. Truth or Dare: Quantitative security analysis using attack trees. Faculty of Electrical Engineering, Mathematics & Computer Science, UT. 2018-15


M. Mehr. Faster Algorithms for Geometric Clustering and Competitive Facility-Location Problems. Faculty of Mathematics and Computer Science, TU/e. 2018-17


P.A. Inostroza Valdera. Structuring Languages as Object-Oriented Libraries. Faculty of Science, UvA. 2018-19


A. Serrano Mena. Type Error Customization for Embedded Domain-Specific Languages. Faculty of Science, UU. 2018-21

S.M.J. de Putter. Verification of Concurrent Systems in a Model-Driven Engineering Workflow. Faculty of Mathematics and Computer Science, TU/e. 2019-01


Ö. Babur. Model Analytics and Management. Faculty of Mathematics and Computer Science, TU/e. 2019-03

A. Afroozeh and A. Izmaylova. Practical General Top-down Parsers. Faculty of Science, UvA. 2019-04

J. Moerman. Nominal Techniques and Black Box Testing for Automata Learning. Faculty of Science, Mathematics and Computer Science, RU. 2019-06


J.J.G. Meijer. Efficient Learning and Analysis of System Behavior. Faculty of Electrical Engineering, Mathematics & Computer Science, UT. 2019-10

P.R. Griffioen. A Unit-Aware Matrix Language and its Application in Control and Auditing. Faculty of Science, UvA. 2019-11

A.A. Sawant. The impact of API evolution on API consumers and how this can be affected by API producers and language designers. Faculty of Electrical Engineering, Mathematics, and Computer Science, TUD. 2019-12


M.A. Cano Grijalba. Session-Based Concurrency: Between Operational and Declarative Views. Faculty of Science and Engineering, RUG. 2020-01

T.C. Nägele. CoHLA: Rapid Co-simulation Construction. Faculty of Science, Mathematics and Computer Science, RU. 2020-02

R.A. van Rozen. Languages of Games and Play: Automating Game Design & Enabling Live Programming. Faculty of Science, UvA. 2020-03

B. Changizi. Constraint-Based Analysis of Business Process Models. Faculty of Mathematics and Natural Sciences, UL. 2020-04