



**26th ACM International Systems and Software
Product Line Conference
September 12-16, 2022
2022.splc.net**

Proceedings - Volume B

EDITED BY:

Alexander Felfernig, Lidia Fuentes, Jane Cleland-Huang, Wesley K. G. Assunção, Clement Quinton, Jianmei Guo, Klaus Schmid, Marianne Huchard, Inmaculada Ayala, José Miguel Rojas, Viet-Man Le and José Miguel Horcas





26th International Systems and Software Product Line Conference

Proceedings - Volume B

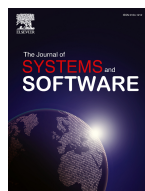
Gold Sponsors



General Sponsors



Further Sponsors



**The Association for Computing Machinery
1601 Broadway, 10th Floor
New York, New York 10019, USA**

ACM COPYRIGHT NOTICE. Copyright © 2022 by the Association for Computing Machinery,

Inc. Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from Publications Dept., ACM, Inc., fax +1 (212) 869-0481, or email permissions@acm.org.

For other copying of articles that carry a code at the bottom of the first or last page, copying is permitted provided that the per-copy fee indicated in the code is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, +1-978-750-8400, +1-978-750-4470 (fax).

ACM ISBN: 978-1-4503-9206-8/22/09

Table of Contents

Organizing Committee	x
Program Committees	xii
Doctoral Symposium	
BEEHIVE - Behaviour-Induced Configuration of High Variability-Intensive Systems <i>Valeria Trombetta</i>	17
Multidisciplinary Variability Management for Cyber-Physical Production Systems <i>Hafiyyan Sayyid Fadhlillah</i>	23
Feature and Variability Extraction from Agile Specifications and their Related Source Code for Software Product Line Migration <i>Thomas Georges</i>	29
Demonstrations and Tools	
V4rdiac: Tooling for Multidisciplinary Delta-Oriented Variability Management in Cyber- Physical Production Systems <i>Hafiyyan Sayyid Fadhlillah, Kevin Feichtinger, Philipp Bauer, Elene Kutsia, and Rick Rabiser</i>	34
Derivation of Subset Product Lines in FeatureIDE <i>Lukas Linsbauer, Paul Westphal, Paul Maximilian Bittner, Sebastian Krieter, Thomas Thüm, and Ina Schaefer</i>	38
FM Fact Label: A Configurable and Interactive Visualization of Feature Model Character- izations <i>José Miguel Horcas Aguilera, José A. Galindo, Mónica Pinto, Lidia Fuentes, and David Bena- vides</i>	42
Baital: An Adaptive Weighted Sampling Platform for Configurable Systems <i>Eduard Baranov and Axel Legay</i>	46
Acapulco: An extensible tool for identifying optimal and consistent feature model config- urations <i>Jabier Martinez, Daniel Strüber, José Miguel Horcas Aguilera, Alexandru Burdusel, and Steffen</i>	50

<i>Zschaler</i>	
ddueruem: A Wrapper for Feature-Model Analysis Tools	54
<i>Tobias Heß, Tobias Müller, Chico Sundermann, and Thomas Thüm</i>	
kconfig-webconf: Retrofitting Performance Models onto Kconfig-Based Software Product Lines	58
<i>Daniel Friesel, Kathrin Elmenhorst, Lennart Kaiser, Michael Müller, and Olaf Spinczyk</i>	
Test2Feature: Feature-based Test Traceability Tool for Highly Configurable Software	62
<i>Willian Douglas Ferrari Mendonça, Silvia Vergilio, Gabriela Karoline Michelin, Alexander Egyed, and Wesley K. G. Assunção</i>	
spl-js-engine: a JavaScript tool to implement Software Product Lines	66
<i>Alejandro Cortiñas, Miguel Rodríguez Luaces, and Oscar Pedreira</i>	
A Tool for Analysing Higher-Order Feature Interactions in Preprocessor Annotations in C and C++ Projects	70
<i>David Korsman, Carlos Diego Damasceno, and Daniel Strüber</i>	
IDE-assisted visualization of indebted OO variability implementations	74
<i>Johann Mortara, Philippe Collet, and Anne-Marie Pinna-Dery</i>	
TD4ViS 2022: 1st International Workshop on Technical Debt for Variability-intensive Systems	
Variability-aware data migration tool	78
<i>David Romero, José A Galindo, José Miguel Horcas, and David Benavides</i>	
REVE 2022: 10th International Workshop on REverse Variability Engineering	
Synchronizing software variants: A two-dimensional approach	82
<i>Christoph König, Kamil Rosiak, Lukas Linsbauer, and Ina Schaefer</i>	
A Prototype of a Crowd-sourcing Platform for Classification and Integration of Analysis Tools in Product Line Engineering	90
<i>Mohammadali Soleymani, David Morais Ferreira, Vasil Tenev, and Martin Becker</i>	
VariVolution 2022: 5th International Workshop on Variability and Evolution of Software-intensive Systems	
Towards an Integrated Approach for Managing the Variability and Evolution of both Software and Hardware Components	94

Jan Willem Wittler, Thomas Kühn, and Ralf Reussner

Advisory: Vulnerability analysis in software development project dependencies 99
Antonio Germán Márquez Trujillo, José Ángel Galindo Duarte, Angel Jesús Varela-Vaca, María Teresa Gómez López, and David Benavides Cuevas

VM4ModernTech 2022: 2nd International Workshop on Variability Management for Modern Technologies

A Tool for Modeling and Analysis of Relationships among Feature Model Views 103
Gökhan Kahraman and Loek Cleophas

WEESR 2022: 5th Workshop on Experiences and Empirical Studies on Software Reuse

Trust Challenges In Reusing Open Source Software: An Interview-based Initial Study . . . 110
Javad Ghofrani, Paria Heravi, Kambiz Aghababazade Babaei, and Mohammad Divband Soorati

Design for the analysis of variability management in the industry 117
Ana Eva Chacón-Luna, Antonio Manuel Gutierrez, David Benavides, and Lidia Fuentes

MODEVAR@SPLC 2022: 5th International Workshop on Languages for Modelling Variability

Bridging the Gap between Academia and Industry: Transforming the Universal Variability Language to pure::variants and Back 123
Dario Romano, Kevin Feichtinger, Danilo Beuche, Uwe Ryssel, and Rick Rabiser

Defining Categorical Reasoning of Numerical Feature Models with Feature-Wise and Variant-Wise Quality Attributes 132
Daniel-Jesus Munoz, Mónica Pinto, Dilian Gurov, and Lidia Fuentes

On the Relation of Variability Modeling Languages and Non-Functional Properties 140
Daniel Friesel, Michael Müller, Matheus Ferraz, and Olaf Spinczyk

ConfWS 2022: 24th International Workshop on Configuration

Configuration of Domotic Systems based on Constraint Solving 145
Gerhard Leitner and Martin Stettinger

Applying Incremental Answer Set Solving to Product Configuration 150
Richard Comploi-Taupe, Giulia Francescutto, and Gottfried Schenner

ConGuess: A Learning Environment for Configuration Tasks 156

<i>Andreas Hofbauer and Alexander Felfernig</i>	
AI implemented toolkit for users' job career "configuration": The case of Create Your Own Future	158
<i>Chiara Grosso, Noorie Sazen, Axel Baker, and Roberto Boselli</i>	
A Meta-Model for Product Configuration Ontologies	166
<i>Ebrahim Khalil Abbasi, Tony Leclercq, and Patrick Heymans</i>	
Test Case Aggregation for Efficient Feature Model Testing	174
<i>Viet-Man Le, Alexander Felfernig, and Thi Ngoc Trang Tran</i>	
Consistency-based Integration of Multi-Stakeholder Recommender Systems With Feature Model Configuration	178
<i>Viet-Man Le, Thi Ngoc Trang Tran, and Alexander Felfernig</i>	
Iterative Constraint Reasoning - Dynamic Constraint Reasoning in Time Space	183
<i>Lothar Hotz, Rainer Herzog, and Stephanie von Riegen</i>	
Knowledge-based Configuration of Videos Using Feature Models	188
<i>Sebastian Lubos, Markus Tautschnig, Alexander Felfernig, and Viet-Man Le</i>	
Configuration Manager: Describing an Emerging Professional Figure	193
<i>Enrico Sandrin, Cipriano Forza, Gerhard Leitner, and Alessio Trentin</i>	
Product Configurators for Additively Manufactured Products: Exploring their peculiar characteristics	201
<i>Robel Negussie Workalemahu, Cipriano Forza, and Nikola Suzic</i>	
Interactive Feature Modeling with Background Knowledge for Validation and Configuration	209
<i>Simon Vandeveld, Benjamin Callewaert, and Joost Vennekens</i>	
A generic knowledge model for resource reconfiguration in the context of Reconfigurable Manufacturing Systems	217
<i>Mathis Allibe, Abdourahim Sylla, and Gülgün Alpan</i>	
Challenges of Testing Self-Adaptive Systems	224
<i>Liliana Marie Prikler, and Franz Wotawa</i>	
Black-Box Optimization in a Configuration System	229
<i>Maximilian Kucher, Tomas Balyo, and Noemi Christensen</i>	
Constraint Solver for a Fixture Design – Results of a Student Case Study	237
<i>Stefan Plappert, Simon Teves, Mevali Öztürk, and Paul Christoph Gembarski</i>	

Table-based Knowledge Representations for Industrial Feature Models 245
Alexander Felfernig, Bettina Ortner, and Viet-Man Le

Organizing Committee

General Chairs

Alexander Felfernig, *Graz University of Technology, Austria*

Lidia Fuentes, *University of Málaga, Spain*

Research Track Chairs

Jane Cleland-Huang, *University of Notre Dame, USA*

Wesley K. G. Assunção, *Johannes Kepler University Linz, Austria & Pontifical Catholic University of Rio de Janeiro, Brazil*

Industrial Systems and Software Product Lines Chairs

Andreas Falkner, *Siemens, Austria*

Maidier Azanza, *University of the Basque Country, UPV/EHU, Spain*

Publicity Chairs

Jihyun Lee, *Jeonbuk National University, Korea*

Ivan Machado, *Federal University of Bahia, Brazil*

Challenge Track Chairs

Laura Semini, *University of Pisa, Italy*

Xavier Devroey, *University of Namur, Belgium*

Demonstration Chairs

Inmaculada Ayala, *University of Málaga, Spain*

José Miguel Rojas, *University of Sheffield, UK*

Workshops Chairs

Clement Quinton, *University of Lille, France*

Jianmei Guo, *East China Normal University, China*

Journal First Chair

Claudia Maria Lima Werner, *UFRJ, Brazil*
Christoph Seidl, *IT University of Copenhagen, Denmark*

Tutorials Chairs

Miguel Á. Rodríguez Luaces, *University of Coruña, Spain*
Megha Bhushan, *DIT University, India*

Doctoral Symposium Chairs

Klaus Schmid, *University of Hildesheim, Germany*
Marianne Huchard, *Université de Montpellier, France*

Hall of Fame Chairs

Goetz Botterweck, *Trinity College Dublin and Lero, Ireland*
Natsuko Noda, *Shibaura Institute of Technology, Japan*

Local Organizing Chair

Thi Ngoc Trang Tran, *Graz University of Technology, Austria*

Local Publicity Chair

Seda Polat Erdeniz, *Graz University of Technology, Austria*

Proceedings Chairs

Viet-Man Le, *Graz University of Technology, Austria*
José Miguel Horcas, *University of Seville, Spain*

Web Chairs

Luisa Rincón, *Pontificia Universidad Javeriana, Colombia*
Martin Stettinger, *Graz University of Technology, Austria*
Sebastian Lubos, *Graz University of Technology, Austria*

Program Committees

Research Track

Shaukat Ali	Simula Research Laboratory, NOR
Eduardo Almeida	Federal University of Bahia, BRA
Juliana Alves Pereira	Pontifical Catholic University of Rio de Janeiro, BRA
Paolo Arcaini	National Institute of Informatics, JPN
David Benavides	University of Seville, ESP
Thorsten Berger	Chalmers University, SWE
Jan Bosch	Chalmers University, SWE
Carlos Cetina	Universidad San Jorge, ESP
Loek Cleophas	TU Eindhoven, The Netherlands & Stellenbosch University, ZAF
Myra Cohen	Iowa State University, USA
Thelma Elita Colanzi	State University of Maringá, BRA
Philippe Collet	Université Côte d'Azur, FRA
Xavier Devroey	University of Namur, BEL
José A. Galindo	University of Seville, ESP
Paul Grünbacher	Johannes Kepler University Linz, AUT
Jacob Krüger	Ruhr-University Bochum, DEU
Axel Legay	UCLouvain, BEL
Malte Lochau	University of Siegen, DEU
Roberto Lopez-Herrejon	ETS Montréal, CAN
Tomi Männistö	University of Helsinki, FIN
Jabier Martinez	Tecnalia, ESP
Mohammad Reza Mousavi	King's College London, GBR
Edson OliveiraJr	State University of Maringá, BRA
Gilles Perrouin	University of Namur, BEL
Rick Rabiser	Johannes Kepler University Linz, AUT
Iris Reinhartz-Berger	University of Haifa, ISR
Ina Schäfer	Technische Universität Braunschweig, DEU
Klaus Schmid	University of Hildesheim, DEU
Christa Schwanninger	Siemens Healthcare, DEU
Daniel Strüber	Chalmers University, SWE
Leopoldo Teixeira	Federal University of Pernambuco, BRA
Maurice ter Beek	CNR-ISTI Pisa, ITA
Thomas Thüm	University of Ulm, DEU
Silvia Regina Vergilio	Federal University of Paraná, BRA
Michael Vierhauser	Johannes Kepler University Linz, AUT
Franz Wotawa	TU Graz, AUT
Tewfik Ziadi	Sorbonne University, FRA

Artifacts Evaluation

Thiago do Nascimento Ferreira	University of Michigan-Flint, USA
Clemens Dubslaff	TU Dresden, DEU
José A. Galindo	University of Seville, ESP
Lea Gerling,	University of Hildesheim, DEU
Michael Lienhardt	ONERA, Palaiseau, Fra
Ivan Machado	Federal University of Bahia, BRA
Kristof Meixner	TU Wien, AUT
Gabriela Michelon	Johannes Kepler University Linz, AUT
Luca Paolini	University of Turin, ITA

Demonstrations, and Tools Track

Hugo Araujo	King's College London, GBR
Christopher Bull	Newcastle University, GBR
Rafael Capilla	Universidad Rey Juan Carlos Madrid, ESP
Diego Cedrim	Amazon
Leonardo Da Silva Sousa	Carnegie Mellon University, USA
Diego Damasceno	Radboud University, NLD
Barbara Gallina	Mälardalen University, SWE
Tsuneo Nakanishi	Kyushu University, JPN
Elena Navarro	University of Castilla-La Mancha, ESP
Joost Noppen	British Telecom, GBR

Industrial Systems and Software Product Lines Track

Alessandra Bagnato	Softimeam Software, FRA
Martin Becker	Fraunhofer IESE Kaiserslautern, DEU
Thorsten Berger	Ruhr-University Bochum, DEU
Goetz Botterweck	Lero, Trinity College Dublin, IRL
Deepak Dhungana	FH Krems, AUT
Sebastien Gerard	CEA, LIST, FRA
Iris Groher	Johannes Kepler University Linz, AUT
Paul Grünbacher	Johannes Kepler University Linz, AUT
Sten Grüner	ABB Corporate Research Germany, DEU
Albert Haag	PMH, DEU
Jean-Marc Jézéquel	University of Rennes, FRA
Leticia Montalvillo	Ikerlan Research Centre, ESP
Johannes Noppen	British Telecom, GBR
Luisa Rincón	Pontificia Universidad Javeriana, Cali, COL

Mehrdad Saadatmand	RISE SICS Västerås, SWE
Richard Taupe	Siemens, AUT
Juha Tiihonen	Variantum, FIN
Juha-Pekka Tolvanen	MetaCase, FIN
Hironori Washizaki	Waseda University, JPN

Doctoral Symposium Track

Rafael Capilla	University Madrid, ESP
Philippe Collet	Université Côte d'Azur – CNRS/I3S, FRA
Oscar Diaz	University of the Basque Country, ESP
Malte Lochau	University of Siegen, DEU
Roberto Lopez-Herrejon	ETS Montreal, CAN
Natsuko Noda	Shibaura Institute of Technology, JPN
Rick Rabiser	Johannes Kepler University Linz, AUT
Iris Reinhartz-Berger	University of Haifa, ISR
Christoph Seidl	IT University of Copenhagen, DNK
Leopoldo Teixeira	Federal University of Pernambuco, BRA
Maurice ter Beek	CNR-ISTI Pisa, ITA
Thomas Thüm	University of Ulm, DEU
Mahsa Varshosaz	IT University of Copenhagen, DNK

Challenges Track

Shaukat Ali	Simula Research Laboratory, NOR
Paolo Aracaini	National Institute of Informatics, JPN
Mikaela Cashman	Oak Ridge National Laboratory, USA
Diego Damasceno	Radboud University, NLD
Xavier Devroey	University of Namur, BEL
Lea Gerling	University of Hildesheim, DEU
Stefania Gnesi	CNR-ISTI Pisa, ITA
Jabier Martinez	Tecnalia, ESP
Raffaella Mirandola	Politecnico di Milano, ITA
Clement Quinton	University of Lille, FRA
Laura Semini	University of Pisa, ITA
Paul Temple	University of Namur, BEL

Journal-First Track

Mikaela Cashman	Oak Ridge National Laboratory, USA
Loek Cleophas	Eindhoven University of Technology, NLD
Laurence Duchien	University of Lille, FRA
Lea Gerling	University of Hildesheim, DEU
Stefania Gnesi	CNR-ISTI Pisa, ITA
Antonio Manuel Gutierrez	LIT CPL Lab, AUT
Eduard Kamburjan	University of Oslo, NOR
Claudia Maria Lima Werner	UFRJ Rio de Janeiro, BRA
Mohammad Reza Mousavi	King's College London, GBR
Edson Oliveira Jr	State University of Maringá, BRA
Christoph Seidl	IT University of Copenhagen, DNK
Mahsa Varshosaz	IT University of Copenhagen, DNK