



# **PATTERNS 2019**

The Eleventh International Conferences on Pervasive Patterns and Applications

May 5 - 9, 2019

Venice, Italy

## **PATTERNS 2019 Editors**

Herwig Mannaert, University of Antwerp, Belgium

Alexander Mirnig, University of Salzburg, Austria

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2019) by International Academy, Research, and Industry Association (IARIA)  
Please refer to the Copyright Information page.

Printed by Curran Associates, Inc. (2019)

International Academy, Research, and Industry Association (IARIA)  
412 Derby Way  
Wilmington, DE 19810

Phone: (408) 893-6407  
Fax: (408) 527-6351

[petre@iaria.org](mailto:petre@iaria.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## Table of Contents

Evolvability Evaluation of Conceptual-Level Inheritance Implementation Patterns <i>Marek Suchanek and Robert Pergl</i>	1
Using Normalized Systems to Explore the Possibility of Creating an Evolvable Firewall Rule-base <i>Geert Haerens and Peter De Bruyn</i>	7
On the Modular Structure and Evolvability of Internet of Things Architectures <i>Tom Vermeire, Jeroen Faes, Peter De Bruyn, and Jan Verelst</i>	17
Pattern Matching in the Era of Big Data: A Benchmark of Cluster Quality Metrics <i>Ole Kristian Ekseth, Per-Jarle Furnes, and Svein-Olaf Hvasshovd</i>	23
Web Security and Privacy for Novices – Part 1: A Pattern Collection and Two Meta-Patterns <i>Alexander G. Mirnig, Artur Lupp, Alexander Meschtscherjakov, and Manfred Tscheligi</i>	29
Web Security and Privacy for Novices – Part 2: Updates, Mail Servers, and E-Commerce <i>Artur Lupp, Alexander G. Mirnig, and Manfred Tscheligi</i>	35
Web Security and Privacy for Novices – Part 3: Backups, Data Security, and GDPR Compliance <i>Artur Lupp, Alexander G. Mirnig, and Manfred Tscheligi</i>	42