



# **SOFTENG 2017**

The Third International Conference on Advances and Trends in Software  
Engineering

April 23 - 27, 2017

Venice, Italy

## **SOFTENG 2017 Editors**

Mira Kajko-Mattsson, Stockholm University & Royal Institute of Technology,  
Sweden

Pål Ellingsen, Bergen University College, Norway

Paolo Maresca, Verisign, Inc., USA

**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© (2017) by International Academy, Research, and Industry Association (IARIA)  
Please refer to the Copyright Information page.

Printed by Curran Associates, Inc. (2017)

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

## **SOFTENG 1: SOFTWARE TESTING AND VALIDATION I**

<b>Visualizing Execution Models and Testing Results</b> .....	1
<i>B. Stepien, L. Peyton, M. Alhaj</i>	
<b>A Comparative Study of GUI Automated Tools for Software Testing</b> .....	7
<i>P. Sabev, K. Grigorova</i>	
<b>Chimera: A Distributed High-throughput Low-latency Data Processing and Streaming System</b> .....	16
<i>P. Lau, P. Maresca</i>	

## **SOFTENG 2: SOFTWARE TESTING AND VALIDATION II**

<b>Integrating Static Taint Analysis in an Iterative Software Development Life Cycle</b> .....	25
<i>T. Lie, P. Ellingsen</i>	
<b>Method for Automatic Resumption of Runtime Verification Monitors</b> .....	31
<i>C. Drabek, G. Weiss, B. Bauer</i>	
<b>Quality Evaluation of Test Oracles Using Mutation</b> .....	37
<i>A. Maciel, R. Oliveira, M. Delamaro</i>	

## **SOFTENG 3: SOFTWARE DESIGNING AND PRODUCTION I**

<b>Visual Component-based Development of Formal Models</b> .....	43
<i>S. Ostroumov, M. Walden</i>	
<b>Analysing the Need for Training in Program Design Patterns - An Empirical Exploration of Two Social Worlds</b> .....	51
<i>V. Holmstedt, S. Mengiste</i>	
<b>A Model-Driven Approach for Evaluating Traceability Information</b> .....	59
<i>H. Bunder, C. Rieger, H. Kuchen</i>	

## **SOFTENG 4: SOFTWARE REUSE**

<b>On the Effect of Minimum Support and Maximum Gap for Code Clone Detection - An Approach Using Apriori-based Algorithm -</b> .....	66
<i>Y. Udagawa</i>	
<b>Function Points and Service-Oriented Architectures: A Reference Model for Component Based Architectures</b> .....	74
<i>R. Meli</i>	
<b>Overview of a Domain-Driven Design Approach to Build Microservice-Based Applications</b> .....	79
<i>R. Steinegger, P. Giessler, B. Hippchen, S. Abeck</i>	

## **SOFTENG 5: SOFTWARE RELIABILITY, ROBUSTNESS, SAFETY**

<b>Consistent Cost Estimation for the Automotive Safety Model based Software Development Life Cycle</b> .....	88
<i>D. Cortese</i>	
<b>A Team Allocation Technique Ensuring Bug Assignment to Existing and New Developers Using Their Recency and Expertise</b> .....	96
<i>A. Khatun, K. Sakib</i>	

## **SOFTENG 6: SOFTWARE DESIGNING AND PRODUCTION II**

<b>Self-Governance Developer Framework</b> .....	103
<i>M. Kajko-Mattsson, G. Jeppesen</i>	

<b>Security and Software Engineering: Analyzing Effort and Cost</b> .....	110
<i>C. Brill, A. Olmsted</i>	
<b>Improving a Travel Management Procedure: An Italian Experience</b> .....	114
<i>A. Calabro, E. Marchetti, G. Spagnolo, P. Cempini, L. Mancini, S. Paoletti</i>	
<b>Author Index</b>	