15th International Conference on Software Technologies (ICSOFT 2020)

Online 7 – 9 July 2020

Editors:

Marten van Sinderen Hans-Georg Fill Leszek Maciaszek

ISBN: 978-1-7138-4064-0

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© (2020) by SCITEPRESS – Science and Technology Publications, Lda. All rights reserved.

Printed with permission by Curran Associates, Inc. (2021)

For permission requests, please contact SCITEPRESS – Science and Technology Publications, Lda. at the address below.

SCITEPRESS – Science and Technology Publications, Lda. Avenida de S. Francisco Xavier, Lote 7 Cv. C, 2900-616 Setúbal, Portugal

Phone: +351 265 520 185 Fax: +351 265520 186

info@scitepress.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 Web: www.proceedings.com

CONTENTS

INVITED SPEAKERS

KEYNOTE SPEAKERS	
Introducing AI/ML Components into Software Systems Dominik Slezak	4
Process Mining as the Superglue between Data and Process Management Wil van der Aalst	7
Software Architects are Dead! Long Live Software Architects! Frank Buschmann	Ç
SOFTWARE ENGINEERING AND SYSTEMS DEVELOPMENT	
FULL PAPERS	
Consistency Analysis of AUTOSAR Timing Requirements Steffen Beringer and Heike Wehrheim	15
Software Test Automation Maturity: A Survey of the State of the Practice Yuqing Wang, Mika V. Mäntylä, Serge Demeyer, Kristian Wiklund, Sigrid Eldh and Tatu Kairi	27
Accelerating Interval Iteration for Expected Rewards in Markov Decision Processes Mohammadsadegh Mohagheghi and Khayyam Salehi	39
Codeless Web Testing using Selenium and Machine Learning Duyen Phuc Nguyen and Stephane Maag	51
A Data-driven Methodology towards Interpreting Readability against Software Properties Thomas Karanikiotis, Michail D. Papamichail, Ioannis Gonidelis, Dimitra Karatza and Andreas L. Symeonidis	61
SHORT PAPERS	
MVCLang: A Software Modeling Language for the Model-View-Controller Design Pattern <i>Mert Ozkaya and Irem Fidandan</i>	75
A Case Study on Performance Optimization Techniques in Java Programming Ciprian Khlud and Cristian Frăsinaru	84
Analysing Large-Scale Scrum Practices with Respect to Quality Requirements Challenges Wasim Alsaqaf, Maya Daneva and Roel Wieringa	92
Transformation- and Pattern-based State Machine Mining from Embedded C Code Andreas Grosche, Burkhard Igel and Olaf Spinczyk	104
Hybrid Context-awareness Modelling and Reasoning Approach for Microgrid's Intelligent Control Soumoud Fkaier, Mohamed Khalgui and Georg Frey	116
A Genetic Algorithm for Automated Test Generation for Satellite On-board Image Processing Applications Ulrike Witteck, Denis Grießbach and Paula Herber	128

Decifarm: A Fuzzy Decision-support Environment for Smart Farming Jérôme Dantan, Hajer Baazaoui Zghal and Yann Pollet	136
Towards Ubiquitous Learning Situations for Disabled Learners Nesrine Ben Salah, Ines Bayoudh Saadi and Henda Ben Ghezala	144
A Systematic Literature Mapping of Artificial Intelligence Planning in Software Testing Luis F. de Lima, Leticia M. Peres, André R. A. Grégio and Fabiano Silva	152
Threat Modeling for Cyber-Physical Systems: A Two-dimensional Taxonomy Approach for Structuring Attack Actions Monika Maidl, Gerhard Münz, Stefan Seltzsam, Marvin Wagner, Roman Wirtz and Maritta Heisel	160
Toward a Correct Implementation of LwM2M Client with Event-B Ines Mouakher, Fatma Dhaou and J. Christian Attiogbé	172
Investigating the Gap between Scrum Theory and Practice in Pakistan Muneeba Jilani and Naveed Ikram	180
An Approach That Stimulates Architectural Thinking during Requirements Elicitation: An Empirical Evaluation Preethu Rose Anish, Maya Daneva, Smita Ghaisas and Roel J. Wieringa	187
Detecting Model View Controller Architectural Layers using Clustering in Mobile Codebases Dragoş Dobrean and Laura Dioşan	196
Visualization Method of Important Regions by Combination of Webpage Structures and Saliency Maps Yuya Inagaki, Hajime Iwata, Junko Shirogane and Yoshiaki Fukazawa	204
Investigating on the Relationships between Design Smells Removals and Refactorings Lerina Aversano, Mario Luca Bernardi, Marta Cimitile, Martina Iammarino and Kateryna Romanyuk	212
Failsafe Mechanism to Hazard Analysis and Risk Mitigation in Unmanned Aerial Vehicle based on NCES Mohamed Naija, Rihab Khemiri and Ernesto Exposito	220
Metrics-driven DevSecOps Wissam Mallouli, Ana Rosa Cavalli, Alessandra Bagnato and Edgardo Montes de Oca	228
Data-centric Refinement of Database-Database Dependency Analysis of Database Program Angshuman Jana	234
Emerging Design Patterns for Blockchain Applications Vijay Rajasekar, Shiv Sondhi, Sherif Saad and Shady Mohammed	242
Formalization and Verification of Reconfigurable Discrete-event System using Model Driven Engineering and Isabelle/HOL Sohaib Soualah, Yousra Hafidi, Mohamed Khalgui, Allaoua Chaoui and Laid Kahloul	250
Improving UI Test Automation using Robotic Process Automation Marina Cernat, Adelina-Nicoleta Staicu and Alin Stefanescu	260

SOFTWARE SYSTEMS AND APPLICATIONS

FULL PAPERS

A Function Dependency based Approach for Fault Localization with D* Arpita Dutta and Rajib Mall	273
Fuzzy Multi-objective Optimization for Ride-sharing Autonomous Mobility-on-Demand Systems <i>Rihab Khemiri and Ernesto Exposito</i>	284
Generic GA-PPI-Net: Generic Evolutionary Algorithm to Detect Semantic and Topological Biological Communities Marwa Ben M'Barek, Amel Borgi, Sana Ben Hmida and Marta Rukoz	295
Bee-route: A Bee Algorithm for the Multi-objective Vehicle Routing Problem Jamila Sassi, Ines Alaya and Moncef Tagina	307
A Bee Colony Optimization Algorithm for the Long-Term Car Pooling Problem Mouna Bouzid, Ines Alaya and Moncef Tagina	319
Superlinear and Bandwidth Friendly Geo-replication for Store-and-forward Systems Daniel Brahneborg, Wasif Afzal, Adnan Čaušević and Mats Björkman	328
On the Improvement of R-TNCESs Verification using Distributed Cloud-based Architecture Choucha Chams Eddine, Mohamed Oussama Ben Salem, Mohamed Khalgui, Laid Kahloul and Naima Souad Ougouti	339
Verifying the Application of Security Measures in IoT Software Systems with Model Learning Sébastien Salva and Elliot Blot	350
An in-Depth Requirements Change Evaluation Process using Functional and Structural Size Measures in the Context of Agile Software Development <i>Hela Hakim, Asma Sellami and Hanêne Ben Abdallah</i>	361
A Real-time Integration of Semantics into Heterogeneous Sensor Stream Data with Context in the Internet of Things Besmir Sejdiu, Florije Ismaili and Lule Ahmedi	376
Temporal Convolutional Networks for Just-in-Time Software Defect Prediction Pasquale Ardimento, Lerina Aversano, Mario Luca Bernardi and Marta Cimitile	384
3D Mobility, Resizing and Mobile Sink Nodes in Reconfigurable Wireless Sensor Networks based on Multi-agent Architecture under Energy Harvesting Constraints Hanen Royainia Hanen Grichi Laid Kahloul and Mohamed Khaleui	394

SHORT PAPERS

Tool Support for Green Android Development: A Systematic Mapping Study Iffat Fatima, Hina Anwar, Dietmar Pfahl and Usman Qamar	409
Towards Secure Data Sharing Processes in Online Social Networks: Trusty Gulsum Akkuzu, Benjamin Aziz and Mo Adda	418
Big Data Streaming Platforms to Support Real-time Analytics Eliana Fernandes, Ana Carolina Salgado and Jorge Bernardino	426
A Retrospective Study of Taxonomy based Testing using Empirical Data from a Medical Device Software Company Hamsini Ketheswarasarma Rajaram, John Loane, Silvana Togneri MacMahon and Fergal Mc Caffery	434
Developer Driven Framework for Security and Privacy in the IoMT Ceara Treacy, John Loane and Fergal McCaffery	443
New Approach for Deadline Calculation of Periodic, Sporadic and Aperiodic Real-time Software Tasks Aicha Goubaa, Mohamed Khalgui, Georg Frey and Zhiwu Li	452
Towards a Better Understanding of Genetic Operators for Ordering Optimization: Application to the Capacitated Vehicle Routing Problem S. Ben Hamida, R. Gorsane and K. Gorsan Mestiri	461
Exploiting Exclusive Higher Resolution to Enhance Response Time of Embedded Flash Storage Jung-Hoon Kim and Young-Sik Lee	470
Blockchain Project Initiation and Execution: Decision-making Practices and Perceptions Bolatzhan Kumalakov and Yassynzhan Shakan	478
Fault Detection and Co-design Recovery for Complex Task within IoT Systems Radia Bendimerad, Kamel Smiri and Abderrazek Jemai	484
Towards a Data Science Framework Integrating Process and Data Mining for Organizational Improvement Andrea Delgado, Adriana Marotta, Laura González, Libertad Tansini and Daniel Calegari	492
Using Blockchain to Implement Traceability on Fishery Value Chain Estrela Ferreira Cruz and António Miguel Rosado da Cruz	501
An Approach to Train and Evaluate the Cybersecurity Skills of Participants in Cyber Ranges based on Cyber-Risk Models Gencer Erdogan, Åsmund Hugo, Antonio Álvarez Romero, Dario Varano, Niccolò Zazzeri and Anže Žitnik	509
Application of Computer Vision Technologies for Automated Utility Meters Reading Maria Spichkova and Johan Van Zyl	521
RiverConc: An Open-source Concolic Execution Engine for x86 Binaries Ciprian Paduraru, Bogdan Ghimis and Alin Stefanescu	529
Towards Quantitative Trade-off Analysis in Goal Models with Multiple Obstacles using Constraint Programming Christophe Ponsard and Robert Darimont	537

On Decomposing Formal Verification of CTL-based Properties on IaaS Cloud Environment Chams Eddine Choucha, Mohamed Ramdani, Mohamed Khalgui and Laid Kahloul	544
Machine Learning Models for Automatic Labeling: A Systematic Literature Review Teodor Fredriksson, Jan Bosch and Helena Holmstrm Olsson	552
FOUNDATIONAL AND TRIGGER TECHNOLOGIES	
FULL PAPERS	
Local Rotation Pattern: A Local Descriptor of Color Textures Hela Jebali, Noël Richard and Mohamed Naouai	567
An Efficient GPGPU based Implementation of Face Detection Algorithm using Skin Color Pre-treatment Imene Guerfi, Lobna Kriaa and Leila Azouz Saidane	574
SHORT PAPERS	
IT-Application Behaviour Analysis: Predicting Critical System States on OpenStack using Monitoring Performance Data and Log Files Patrick Kubiak, Stefan Rass and Martin Pinzger	589
A Parallel Many-core CUDA-based Graph Labeling Computation Stefano Quer	597
A Novel Approach for Android Malware Detection and Classification using Convolutional Neural Networks Ahmed Lekssays, Bouchaib Falah and Sameer Abufardeh	606
Bi-Objective CSO for Big Data Scientific Workflows Scheduling in the Cloud: Case of LIGO Workflow K. Bousselmi, S. Ben Hamida and M. Rukoz	615
An Optimization Method for Entity Resolution in Databases: With a Case Study on the Cleaning of Scientific References in Patent Databases <i>Emiel Caron</i>	625
AUTHOR INDEX	633