

## **CLOUD COMPUTING 2019**

The Tenth International Conference on Cloud Computing, GRIDs, and Virtualization

May 5 - 9, 2019

Venice, Italy

## **CLOUD COMPUTING 2019 Editors**

Bob Duncan, University of Aberdeen, UK Yong Woo Lee, University of Seoul, Korea Magnus Westerlund, Arcada University of Applied Sciences, Finland Andreas Aßmuth, Technical University of Applied Sciences OTH Amberg-Weiden, Germany 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

## 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

## **Table of Contents**

Monitoring and Managing IoT Applications in Smart Cities Using Kubernetes Shapna Muralidharan, Gyuwon Song, and Heedong Ko	1
The Weaponization of Cloud-based Social Media: Prospects for Legislation and Regulation Barry Cartwright, George Weir, Lutfun Nahar, Karmvir Padda, and Richard Frank	7
Invisible Ubiquity - Cloud Security in UK Corporate Annual Reporting Bob Duncan and Mark Whittington	13
Investigating the Tension Between Cloud- Related Actors and Individual Privacy Rights Bob Duncan, Karen Renaud, and Beverley Mackenzie	19
EU General Data Protection Regulation Compliance Challenges for Cloud Users Bob Duncan	25
Cloud Compliance Risks Bob Duncan and Yuan Zhao	31
Towards Trustworthy Financial Reports Using Blockchain Van Thanh Le, Gianfranco D'Atri, Nabil El Ioini, and Claus Pahl	37
Version Control Using Distributed Ledger Technologies for Internet of Things Device Software Updates Magnus Westerlund, John Wickstrom, and Goran Pulkkis	43
Governance in Decentralized Ecosystems: A Survey of Blockchain and Distributed Ledger White Papers Petri Honkanen, Magnus Westerlund, and Mats Nylund	49
Blockchain Challenges for Cloud Users Yuan Zhao and Bob Duncan	55
Cloud Security and Security Challenges Revisited Fabian Suss, Marco Freimuth, Andreas Assmuth, George Weir, and Robert Duncan	61
UnCle SAM: Modeling Cloud Attacks with the Automotive Security Abstraction Model Markus Zoppelt and Ramin Tavakoli Kolagari	67
Fighting Disinformation Warfare with Artificial Intelligence: Identifying and Combating Disinformation Attacks in C Barry Cartwright, George Weir, and Richard Frank	73

PLASMA – Platform for Service Management in Digital Remote Maintenance Applications Natascha Stumpp, Doris Aschenbrenner, Manuel Stahl, and Andreas Assmuth	78
Risk Analysis of the Cloud Infrastructure of Smart Grid and Internet of Things Katrin Neubauer, Sebastian Fischer, and Rudolf Hackenberg	82
Security of Cloud Services with Low-Performance Devices in Critical Infrastructures Michael Molle, Ulrich Raithel, Dirk Kraemer, Norbert Grass, Matthias Sollner, and Andreas Assmuth	88
Performance Comparision between Scaling of Virtual Machines and Containers using Cassandra NoSQL Database Sogand Shirinbab, Lars Lundberg, and Emiliano Casalicchio	93
BalloonJVM: Dynamically Resizable Heap for FaaS Abraham Chan, Kai-Ting Amy Wang, and Vineet Kumar	99
Efficient Virtual Machine Consolidation Approach Based on User Inactivity Detection Jan Fesl, Vineet Gokhale, and Marie Feslova	105
Anomaly Detection and Analysis for Clustered Cloud Computing Reliability Areeg Samir and Claus Pahl	110
Relational Algebra for Heterogeneous Cloud Data Sources Aspen Olmsted	120
Building Trust in Cloud Computing – Isolation in Container Based Virtualisation Ibrahim Alobaidan, Michael Mackay, and Nathan Shone	127
Cloud-RAIR: A Cloud Redundant Array of Independent Resources Abdelhamid Khiat	133