15th International Conference on Cloud Computing and Services Science (CLOSER 2025)

Porto, Portugal
1-3 April 2025

Editors:

Valeria Cardellini
Maarten van Steen

ISBN: 979-8-3313-1870-3

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© (2025) by SCITEPRESS – Science and Technology Publications, Lda.
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

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

Edge AI (2.0) For Future Computing 5
Aaron Ding

Decentralised Machine Learning As an Enabler of Decentralised Online Services 7
Sonia Ben Mokhtar

A Brief Journey Through History: From Distributed Objects over SOA to Microservices 9
Philipp Leitner

PAPERS

FULL PAPERS

Performance and Usability Implications of Multiplatform and WebAssembly Containers 15
Sangeeta Kakati and Mats Brorsson

Operations Patterns for Hybrid Quantum Applications 26
Martin Beisel, Johanna Barzen, Frank Leymann and Benjamin Weder

Optimization of Cloud-Native Application Execution over the Edge-Cloud Continuum Enabled by DVFS 37
Georgios Kontos, Polyzois Soumplis and Emmanouel Varvarigos

Energy-Aware Node Selection for Cloud-Based Parallel Workloads with Machine Learning and Infrastructure as Code 49
Denis B. Citadin, Fábio Diniz Rossi, Marcelo C. Luizelli, Philippe O. A. Navaux and Arthur F. Lorenzon

LLM-Based Adaptive Digital Twin Allocation for Microservice Workloads 61
Pedro Henrique Sachete Garcia, Ester de Souza Oribes, Ivan Mangini Lopes Junior, Braulio Marques de Souza, Angelo Nery Vieira Crestani, Arthur Francisco Lorenzon, Marcelo Caggiani Luizelli, Paulo Silas Severo de Souza and Fábio Diniz Rossi

SLO and Cost-Driven Container Autoscaling on Kubernetes Clusters 72
Angelo Marchese and Orazio Tomarchio

Security-Aware Allocation of Replicated Data in Distributed Storage Systems 80
Sabrina De Capitani di Vimercati, Sara Foresti, Giovanni Livraga, Pierangela Samarati and Mauro Tedesco

Performance Analysis of mdx II: A Next-Generation Cloud Platform for Cross-Disciplinary Data Science Research 92
Keichi Takahashi, Tomonori Hayami, Yu Mukaizono, Yuki Teramae and Susumu Date

SHORT PAPERS

Data Orchestration Platform for AI Workflows Execution Across Computing Continuum 103
Gabriel Ioan Arcas and Tudor Cioara

Framework for Decentralized Data Strategies in Virtual Banking: Navigating Scalability, Innovation, and Regulatory Challenges in Thailand 111
Worapol Alex Pongpech and Pasd Putthapipat

OTRA: A Risk Management Ontology for Transparent Service Level Agreements in Federated Cloud Environment 119
Giulia Biagioni, Resul Serkan Keskin, Lawrence Cook, Edwin Harmsma and Erik Langius

Anomaly Detection for Partially Observable Container Systems Based on Architecture Profiling 127
Isidora Erakovic and Claus Pahl

Job Generator for Evaluating and Comparing Scheduling Algorithms for Modern GPU Clouds 136
Michal Konopa, Jan Fesl and Ladislav Beránek

Optimization of Food Inputs in Restaurants in Metropolitan Lima Through Prediction and Monitoring Based on Machine Learning 144
Marcos Olivos, Alexandre Motta and Pedro Castaneda

Infrastructure as Code: Technology Review and Research Challenges 151
Claus Pahl, Niyazi Gokberk Gunduz, Övgüm Can Sezen, Ali Ghamgosar and Nabil El Ioini

WFQ-Based SLA-Aware Edge Applications Provisioning 159
Pedro Henrique Sachete Garcia, Arthur Francisco Lorenzon, Marcelo Caggiani Luizelli, Paulo Silas Severo de Souza and Fábio Diniz Rossi

A Framework for Evaluating Integration Testing Criteria in Serverless Applications 167
Stefan Winzinger and Guido Wirtz

Literature Review on Cloud-Based Service-Oriented Architecture for IEC 61499 Distributed Control Systems 174
Tomás Torres, Gil Gonçalves and Rui Pinto

Idempotency in Service Mesh: For Resiliency of Fog-Native Applications in Multi-Domain Edge-to-Cloud Ecosystems 182
Matthew Whitaker, Bruno Volckaert and Mays Al-Naday

EMERALD: Evidence Management for Continuous Certification as a Service in the Cloud 190
Christian Banse, Björn Fanta, Juncal Alonso and Cristina Martinez

Protecting Privacy in Federated Time Series Analysis: A Pragmatic Technology Review for Application Developers 198
Daniel Bachlechner, Ruben Hetfleisch, Stephan Krenn, Thomas Lorünser and Michael Rader

The Evolution of Cloud Computing Towards a Vendor Agnostic Market Place Using the SKY CONTROL Framework 211
Henry-Norbert Cocos, Christian Baun and Martin Kappes

A Cost-Benefit Analysis of Additive Manufacturing as a Service 219
Igor Ivkić, Tobias Buhmann and Burkhard List

Towards Optimizing Cost and Performance for Parallel Workloads in Cloud Computing 231
William Maas, Fábio Diniz Rossi, Marcelo C. Luizelli, Philippe O. A. Navaux and Arthur F. Lorenzon

Advancing Serverless Workflow Efficiency: Integrating Functional Programming Constructs and DAG-Based Execution 239
Nimród Földvári and Florin Crăciun

A Concept for Accelerating Long-Term Prototype Testing Using Anomaly Detection and Digital Twins 247
Vincent Nebel, Pia Goßrau-Lenau, Harshvardhan Agarwal and Dirk Werth

Hybrid Root Cause Analysis for Partially Observable Microservices Based on Architecture Profiling 255
Isidora Erakovic and Claus Pahl

A Framework for Real-Time Monitoring of Power Consumption of Distributed Calculation on Computational Cluster 264
Adam Krechowicz

AUTHOR INDEX 273