

# **2024 IEEE 27th International Symposium on Real-Time Distributed Computing (ISORC 2024)**

**Tunis, Tunisia  
22-25 May 2024**



**IEEE Catalog Number: CFP24175-POD  
ISBN: 979-8-3503-7129-1**

**Copyright © 2024 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP24175-POD
ISBN (Print-On-Demand):	979-8-3503-7129-1
ISBN (Online):	979-8-3503-7128-4
ISSN:	2770-1611

**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  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## TABLE OF CONTENTS

Enhanced RF-Based 3D UAV Outdoor Geolocation: From Trilateration to Machine Learning Approaches .....	1
<i>Mariam Belhor, Anne Savard, Anthony Fleury, Patrick Sondi, Valeria Loscri</i>	
SRAM-PUF Authentication Schemes Empowered with Blockchain on Resource-Constrained Microcontrollers .....	9
<i>Mario Barbareschi, Franco Cirillo, Christian Esposito</i>	
Two-Step Register Allocation for Implementing Single-Path Code .....	19
<i>Emad Jacob Maroun, Martin Schoeberl, Peter Puschner</i>	
Securing Real-Time Systems Using Schedule Reconfiguration .....	31
<i>Zain A. H. Hammadeh, Monowar Hasan, Mohammad Hamad</i>	
Multivariate LSTM for Execution Time Prediction in HPC for Distributed Deep Learning Training .....	41
<i>Tasnim Assali, Zayneb Trabelsi Ayoub, Sofiane Ouni</i>	
Machine Learning Based Outlier Detection in IoT Greenhouse .....	46
<i>Aymen Abid, Omar Cheikhrouhou, Ghada Zaibi, Abdennaceur Kachouri</i>	
Towards Lingua Franca on the Patmos Processor .....	55
<i>Ehsan Khodadad, Luca Pezzarossa, Martin Schoeberl</i>	
Low Latency PBFT Parallel Consensus for IoT Blockchain Platform .....	60
<i>Rabeb Ben Othmen, Wassim Abbessi, Sofiane Ouni, Wafa Badreddine, Gilles Dequen</i>	
The Adaptation Mechanism of Chameleon - A Comprehensive Adaptive Middleware for Mixed-Critical Cyber-Physical Networks .....	66
<i>Melanie Feist, Uwe Brinkschulte, Mathias Pacher</i>	
Evaluation of Trust Metrics in an Artificial Hormone System .....	76
<i>Philipp Homann, Jonas Diegelmann, Mathias Pacher, Uwe Brinkschulte</i>	
Variable Neighborhood Search-Based Resource Allocation for Vehicle-to-Everything Communications .....	88
<i>Ibtissem Brahmi, Souhir Elleuch, Monia Hamdi, Faouzi Zarai</i>	
Intrusion Detection Schemes Based on Synthetic Minority Oversampling Technique and Machine Learning Models .....	94
<i>Ali Hussein Ali, Maha Charfeddine, Boudour Ammar, Bassem Ben Hamed</i>	
Object Detection Using Convolutional Neural Networks: A Comprehensive Review .....	102
<i>Hanen Issaoui, Asma Eladel, Mourad Zaied</i>	
The HiTar-23 Dataset Construction and Validation for Securing Industrial Internet of Things Environment .....	108
<i>Tarak Dhaouadi, Hichem Mrabet, Abderrazek Jemai</i>	
An IoT Semantic Web Service for Objects Identifying .....	114
<i>Chaima Bejaoui, Fatma Achour, Nasreddine Hajlaoui, Anis Jedidi</i>	
Performance Evaluation of Real-Time Localization and Positioning Algorithms for WSNs .....	120
<i>Maher Jabberi, Bassem Sellami, Akram Hakiri, Adel M. Alimi</i>	

Security Assessment Solutions for IoT Devices .....	126
<i>Moez Balti, Hichem Mrabet, Abderrazek Jemai</i>	
Controllable Virtual Network Service Over a Multi-Administrative Multi-domain Network.....	132
<i>Stanislas Pedebearn, Slim Abdellatif, Pascal Berthou, Dariusz Nogalski, Dallal Belabed</i>	
Exploration of Network Interface Architectures for a Real-Time Network-on-Chip .....	142
<i>Martin Schoeberl</i>	
TECS/Rust: Memory-Safe Component Framework for Embedded Systems .....	150
<i>Nao Yoshimura, Hiroshi Oyama, Takuya Azumi</i>	
Towards a Participatory Cloud Infrastructure for Hosting Services: QoS-Aware Dynamic Orchestration of Microservices .....	161
<i>Bruno Stévant, Jean-Loui Pazat, Alberto Blanc</i>	
On the Impacts of Shared-Resource Contention on Intrusion Detection Systems Based on Performance Monitoring .....	167
<i>Leonardo Passig Horstmann, Antônio Augusto Fröhlich, Marcus Völp</i>	
Performance Evaluation of LoRaWAN Propagation Models for Real-Time IoT Deployments.....	175
<i>Marwa Said, Karim Houidi, Akram Hakiri, Nédra Mellouli-Nauwynck, Hella Kaffel Ben Ayed</i>	
Multicore DRAM Bank-& Row-Conflict Bomb for Timing Attacks in Mixed-Criticality Systems.....	181
<i>Antonio Savino, Gautam Gala, Marcello Cinque, Gerhard Fohler</i>	
An Improved Security-Cognizant Scheduling Model .....	191
<i>Fatima Raadia, Nathan Fisher, Thidapat Chantem, Sanjoy Baruah</i>	
Real-Time Embedded Monitoring Technologies in Modern Healthcare Systems: A Survey .....	199
<i>Sree Charitha Meka, Sanjana Achan, Robert G. Pettit</i>	
Analyzing Public Transit Schedule Deviations: A Case Study on Montreal Using Real-Time Data.....	205
<i>Emna Boudabous, Mohamed Karaa, Lokman Sboui, Julio Montecinos, Omar Alam</i>	
A New Covert Channel in Fixed-Priority Real-Time Multiframe Tasks .....	211
<i>Mohammad Fakhruddin Babar, Monowar Hasan</i>	
Multi-Criteria Optimization of Distributed Real-Time Network Topologies .....	217
<i>Florient Champenois, Florian Brandner, Thierry Grandpierre, Etienne Borde, Abraham Suissa, Laurent Georges</i>	
Federated Learning Models for Real-Time IoT: A Survey .....	228
<i>Karim Houidi, Marwa Said, Akram Hakiri, Nédra Mellouli-Nauwynck, Hella Kaffel Ben Ayed</i>	
Multi-Access Edge Computing: Striking a Balance Between QoE and Energy Efficiency .....	234
<i>Dallal Belabed</i>	
Preventing Order Inversion Within Function-As-A-Service for Sensor Networks.....	240
<i>Takashi Ikegami, Ichiro Satoh, Tatsuo Nakajima</i>	
Decentralized Identity Management and Privacy-Enhanced Federated Learning for Automotive Systems: A Novel Framework .....	246
<i>Biagio Boi, Marco De Santis, Christian Esposito</i>	
An Explainable Method for Cost-Efficient Multi-View Fall Detection.....	252
<i>Amani Elaoud, Achraf Khazri, Walid Barhoumi</i>	

Hierarchical Heterogeneous Cluster Systems for Scalable Distributed Deep Learning .....	262
<i>Yibo Wang, Tongsheng Geng, Ericson Silva, Jean-Luc Gaudiot</i>	
Integrating Random Forest Prediction for Energy Optimization in Solar-Powered Environmental Monitoring.....	268
<i>Ahmed Bali, Pierre-Emmanuel Hladik, Horace Gandji, Abdelouahed Gherbi, Mohamed Cheriet</i>	
Managing Complexity in Safety-Critical Railway Signaling Systems Using Simplex Architectures .....	278
<i>Robert Schmid, Katja Assaf, Clemens Tiedt, Frederic Reiter, Dirk Friedenberger, Andreas Polze</i>	
Architectural Security and Trust Foundation for RISC-V .....	284
<i>Marouene Boubakri, Belhassen Zouari</i>	
Checkpointing-Aware End-to-End Data Age Analysis of Task Chains Under Transient Faults.....	292
<i>Sridhar Mallareddy, Pavan Kumar Kondooru, Deepak Gangadharan</i>	
Time Granularity in Behavioural Structured Acyclic Nets .....	302
<i>Salma Alharbi</i>	
Streamlining CPS Validation: Using Interoperable UML Tools for Seamless Model Exchange.....	314
<i>Antonio Rosales Viesca, Mustafa Al Lail, Omar Alam</i>	
Evaluation of Early Packet Drop Scheduling Policies in Criticality-Aware Wireless Sensor Networks .....	318
<i>Andras Pinter, Leandro Soares Indrusiak, Ian Gray</i>	

**Author Index**