

2022 IEEE 21st International Symposium on Network Computing and Applications (NCA 2022)

**Boston, Massachusetts, USA
14-16 December 2022**



**IEEE Catalog Number: CFP22295-POD
ISBN: 979-8-3503-9731-4**

**Copyright © 2022 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:	CFP22295-POD
ISBN (Print-On-Demand):	979-8-3503-9731-4
ISBN (Online):	979-8-3503-9730-7
ISSN:	2643-7910

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
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Conference Program

- vii Message from the Steering Committee Chair and General Chair
- ix Message from the Program Chairs
- xi Conference Committee
- xiii Technical Program Committee
- xv External Reviewers

Regular papers

1

- 1 A Zero Trust approach for the cybersecurity of Industrial Control Systems
Silvio Russo, Michele Colajanni, Claudio Zanasi and Federico Magnanini
- 9 ALDER: Unlocking blockchain performance by multiplexing consensus protocols
Kadir Korkmaz, Joachim Bruneau-Queyreix, Sonia Ben Mokhtar and Laurent Réveillère
- 19 Alternating MPR: a balanced broadcast algorithm for MANETs
Aymeric Agon-Rambosson, Jonathan Lejeune, Julien Sopena and Pierre Sens
- 27 An analytic hierarchy process (AHP) based UAV selection mechanism for beyond 5G networks
Sridevi S, Jacob Augustine and Shankar Ghosh
- 35 BFT-Blocks: The Case for Analyzing Networking in Byzantine Fault Tolerant Consensus
Richard von Seck, Filip Rezabek, Benedikt Jaeger, Sebastian Gallenmüller and Georg Carle
- 45 Bi-objective optimization of availability and cost for cloud services
Andre Bento, João Soares, António Ferreira, Joao Duraes, José Ferreira, Rita Carreira, Filipe Araujo and Raul Barbosa
- 55 Bluetooth Peer-to-Peer Location Certification with a Gamified Mobile Application
Ricardo Grade, Samih Eisa and Miguel Pardal
- 63 Byzantine Fault-Tolerant Causal Broadcast on Incomplete Graphs
Anshuman Misra and Ajay Kshemkalyani
- 73 Causal Ordering Properties of Byzantine Reliable Broadcast Primitives
Anshuman Misra and Ajay Kshemkalyani
- 81 Comparison of Machine Learning-based anomaly detectors for Controller Area Network
Andrea Venturi, Dario Stabili, Francesco Pollicino, Emanuele Bianchi and Mirco Marchetti
- 89 Data-driven Method for In-band Network Telemetry Monitoring of Aggregated Traffic
Mehrzad Lavassani, Johan Åkerberg and Mats Björkman
- 97 Deep Packet Inspection at Scale: Search Optimization Through Locality-Sensitive Hashing
Maya Kapoor, Thomas Moyer and Siddharth Krishnan
- 107 Deep Reinforcement Learning for Downlink Resource Allocation in Vehicular Small Cell Networks
Ibtissem Brahmi, Monia Hamdi, Ines Rahmany and Faouzi Zarai

- 115 Detecting Causality in the Presence of Byzantine Processes: There is No Holy Grail
Anshuman Misra and Ajay Kshemkalyani
- 123 Energy-Aware Routing in SDN Enabled Data Center Network
Priyanka Kamboj and Sujata Pal
- 131 Formal models for the verification, performance evaluation, and comparison of IoT communication protocols
Imene Ben Hafaiedh
- 139 In-depth analysis of the IDA-Gossip protocol
Kadir Korkmaz, Joachim Bruneau-Queyreix, Stéphane Delbruel, Sonia Ben Mokhtar and Laurent Réveillère
- 149 Infrastructure-centric, NetworkServer-agnostic LoRaWAN Roaming
Giovanni Merlino, Rafael Asorey Cacheda, Luca D'Agati, Francesco Longo, Antonio-Javier Garcia-Sanchez, Joan Garcia-Haro and Antonio Puliafito
- 157 Inter-slice B5G Bandwidth Resource Allocation
Fadoua Debbabi, Raouia Taktak, Rihab Jmal, Lamia Chaari and Rui Luis Aguiar
- 165 LoCaaS: Location-Certification-as-a-Service
Lucas Vicente, Samih Eisa and Miguel Pardal
- 173 MAB based Network Selection mechanism for URLLC users in RIS assisted network
Souvik Deb, Shankar Ghosh and Sasthi Ghosh
- 181 MPEC2: Multilayer and Pipeline Video Encoding on the Computing Continuum
Samira Afzal, Zahra Najafabadi Samani, Narges Mehran, Christian Timmerer and Radu Prodan
- 191 Mobility-aware Multi-Access Edge Computing for Multiplayer Augmented and Virtual Reality Gaming
Ramesh Singh, Radhika Sukapuram and Suchetana Chakraborty
- 201 Multiplicative Partially Homomorphic CRT Secret Sharing
Yaniv Kleinman and Shlomi Dolev
- 209 Never Alone: a Quality of Context-aware Monitoring System for Aging in Place Smart Home
Hajer Nabli, Ines Regaig, Raoudha Ben Djemaa and Layth Sliman
- 217 Reinforcement Learning-based Virtual Sensors Provision in Internet of Vehicles (IoV)
Slim Abbes and Slim Rekhis
- 225 Reputation-based state machine replication
Muhong Huang, Runchao Han, Zhiqiang Du, Yanfang Fu and Liangxin Liu
- 235 Robustness evaluation of Network Intrusion Detection Systems based on Sequential Machine Learning
Andrea Venturi, Claudio Zanasi, Mirco Marchetti and Michele Colajanni
- 243 SixPack v2: enhancing SixPack to avoid last generation misbehavior detectors in VANETs
Giovanni Gambigliani Zoccoli, Francesco Pollicino, Dario Stabili and Mirco Marchetti

- 251 Software-defined Dynamic 5G Network Slice Management for Industrial Internet of Things
Ziran Min, Shashank Shekhar, Charif Mahmoudi, Valerio Formicola, Swapna Gokhale and Aniruddha Gokhale
- 261 SureRepute: Reputation System for Crowdsourced Location Witnesses
Rafael Figueiredo, Samih Eisa and Miguel Pardal
- 269 Swarming with (Visual) Secret (Shared) Mission
Shlomi Dolev, Alexander Fok and Michael Segal
- 277 WebDHT: browser-compatible distributed hash table for decentralized Web applications
Lorenzo Rossi and Luca Ferretti

Short papers **285**

- 285 Modularized and Contract-Based Prediction Models in Programmable Networks
Michel Neves, André Riker, Jéferson Campos Nobre, Antônio Abelém and Bruno Dalmazo
- 291 On the Performance of Machine Learning at the Network Edge to Detect Industrial IoT Faults
Yuri Santo, Bruno Dalmazo, Roger Immich and André Riker
- 297 On using Cellular Automata for Modeling the Evolution of Dynamic-Link Network Parameters
Erick Petersen, Jorge Lopez, Natalia Kushik, Claude Poletti and Djamal Zeglache

Work in progress papers **303**

- 303 Distributed Coordination Based on Quantum Entanglement (Work In Progress)
Yotam Ashkenazi and Shlomi Dolev
- 307 Enforcing delay-aware fog-cloud based IoT firewall (Work In Progress)
Towhidul Islam, Asif Ahmed, Tanvir Raihan and Rezwana Reaz

Index of Authors **311**