

2024 43rd International Symposium on Reliable Distributed Systems (SRDS 2024)

**Charlotte, North Carolina, USA
30 September - 3 October 2024**



**IEEE Catalog Number: CFP24059-POD
ISBN: 979-8-3315-3004-4**

**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:	CFP24059-POD
ISBN (Print-On-Demand):	979-8-3315-3004-4
ISBN (Online):	979-8-3315-3003-7
ISSN:	1060-9857

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

2024 43rd International Symposium on Reliable Distributed Systems (SRDS) **SRDS 2024**

Table of Contents

Message from General Chairs	x
Message from Program Chairs	xi
Organizing Committee	xii
Program Committee	xiii
External Reviewers	xiv
Steering Committee	xv
Acknowledgements	xvi

Research #1: Dependability

Harmonizing Repair and Maintenance in LRC-Coded Storage	1
<i>Keyun Cheng (The Chinese University of Hong Kong), Si Wu (University of Science and Technology of China), Xiaolu Li (Huazhong University of Science and Technology), and Patrick P. C. Lee (The Chinese University of Hong Kong)</i>	
MSF-Model: Queuing-Based Analysis and Prediction of Metastable Failures in Replicated Storage Systems	12
<i>Farzad Habibi (UC Irvine), Tania Lorida-Botran (Roblox), Ahmad Showail (Taibah University), Daniel Sturman (Roblox), and Faisal Nawab (UC Irvine)</i>	
Availability Analysis of Network-Attack-Resilient Byzantine Fault Tolerant Systems	23
<i>Aren Alyahya (University of Pittsburgh), David Tipper (University of Pittsburgh), and Amy Babay (University of Pittsburgh)</i>	

Research #2 - Systems

HAPPA: A Modular Platform for HPC Application Resilience Analysis with LLMs Embedded	40
<i>Hailong Jiang (Kent State University, USA), Jianfeng Zhu (Kent State University, USA), Bo Fang (Pacific Northwest National Laboratory, USA), Kevin Barker (Pacific Northwest National Laboratory, USA), Chao Chen (Intel Corporation, USA), Ruoming Jin (Kent State University, USA), and Qiang Guan (Kent State University, USA)</i>	

Resilient and Secure Programmable System-on-Chip Accelerator Offload	52
<i>Inês Pinto Gouveia (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Ahmad T. Sheikh (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Ali Shoker (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Suhaib A. Fahmy (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), and Paulo Esteves-Verissimo (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)</i>	
Tolerating Compound Threats in Critical Infrastructure Control Systems	66
<i>Sahiti Bommareddy (Johns Hopkins University), Maher Khan (University of Pittsburgh), Huzaiifah Nadeem (University of Pittsburgh), Benjamin Gilby (University of Pittsburgh), Imes Chiu (Defense Logistics Agency), John W. van de Lindt (Colorado State University), Omar Nofal (Florida International University), Mathaios Panteli (University of Cyprus), Linton Wells (George Mason University), Yair Amir (Johns Hopkins University), and Amy Babay (University of Pittsburgh)</i>	
Efficient Exploration on Worst-Case Delay Performance of Networked Industrial Control Systems via Network Calculus and Deep Learning	80
<i>Zhiqi Liang (South China Normal University), Jiajie Zeng (South China Normal University), Shuai Peng (South China Normal University), Xiaoguang Ma (University of Wisconsin-Platteville), and Huan Yang (South China Normal University)</i>	

Research #3: Security

Evaluating the Potential of In-Memory Processing to Accelerate Homomorphic Encryption	92
<i>Mpoki Mwaisela (University of Neuchâtel, Switzerland), Joel Hari (University of Bern, Switzerland), Peterson Yuhala (University of Neuchâtel, Switzerland), Jâmes Ménétrety (University of Neuchâtel, Switzerland), Pascal Felber (University of Neuchâtel, Switzerland), and Valerio Schiavoni (University of Neuchâtel, Switzerland)</i>	
Efficient Identity-Based Encryption with Minimal Server Trust	104
<i>Yuan Liang (Virginia Tech, USA), Giovanni Di Crescenzo (Peraton Labs, USA), Haining Wang (Virginia Tech, USA), and Zahir Patni (Peraton Labs, USA)</i>	
PR-TDR: Privacy-Preserving and Reliable Timed Data Release	115
<i>Jingzhe Wang (University of Pittsburgh, USA) and Balaji Palanisamy (University of Pittsburgh, USA)</i>	
To Share or Hide: Confidential Model Compilation as a Service with Privacy-Preserving Transparency	126
<i>Kailun Qin (Shanghai Jiao Tong University, China) and Dawu Gu (Shanghai Jiao Tong University, China)</i>	

Research #4: Blockchain 1

- Presto: Optimizing Cross-Shard Transactions in Sharded Blockchain Architecture 139
Qiuyu Ding (Peking University), Rongkai Zhang (Peking University), Shenglin Yin (Peking University), PengZe Li (Peking University), Shengjie Guan (Peking University), Zhen Xiao (Peking University), and Jieyi Long (Theta Labs, Inc.)
- DecentEdge: A Trusted Edge-Cloud Transaction Processing Protocol for NFT-Based DApps 150
Hari Kishore Chaparala (University of California, Irvine, USA), Sai Vineeth Doddala (University of California, Irvine, USA), Ahmad Showail (Taibah University, Saudi Arabia), and Faisal Nawab (University of California, Irvine, USA)
- Batch-Schedule-Execute: On Optimizing Concurrent Deterministic Scheduling for Blockchains 163
Yaron Hay (Technion, Israel) and Roy Friedman (Technion, Israel)

Research #5: Algorithms

- Simpler is Better: Revisiting Mencius State Machine Replication 175
Cui Bocheng (University of New Hampshire, United States) and Aleksey Charapko (University of New Hampshire, United States)
- ARES II: Tracing the Flaws of a (Storage) God 187
Chryssis Georgiou (University of Cyprus), Nicolas Nicolaou (Algolysis Ltd), and Andria Trigeorgi (University of Cyprus & Algolysis Ltd)
- DTC: Real-Time and Accurate Distributed Triangle Counting in Fully Dynamic Graph Streams 198
Wei Xuan (Institute of Computing Technology, Chinese Academy of Sciences, China), Yan Liang (Institute of Computing Technology, Chinese Academy of Sciences, China), Huawei Cao (Institute of Computing Technology, Chinese Academy of Sciences, China; Zhongguancun Laboratory, China), Ning Lin (The University of Hong Kong, China), Xiaochun Ye (Institute of Computing Technology, Chinese Academy of Sciences, China), and Dongrui Fan (Institute of Computing Technology, Chinese Academy of Sciences, China)

Research #6: ML

- TabVFL: Improving Latent Representation in Vertical Federated Learning 210
Mohamed Rashad (TU Delft, The Netherlands), Zilong Zhao (National University of Singapore, Singapore), Jérémie Decouchant (TU Delft, The Netherlands), and Lydia Y. Chen (TU Delft, The Netherlands; University of Neuchatel, Switzerland)
- RADAR: Model Quality Assessment for Reputation-Aware Collaborative Federated Learning 222
Léo Lavaur (IMT Atlantique / IRISA, France), Pierre-Marie Lechevalier (IMT Atlantique / IRISA, France), Yann Busnel (IMT Nord Europe / IRISA, France), Romaric Ludinard (IMT Atlantique / IRISA), Marc-Oliver Pahl (IMT Atlantique / IRISA), and Géraldine Texier (IMT Atlantique / IRISA)

On Quantifying the Gradient Inversion Risk of Data Reuse in Federated Learning Systems	235
<i>Jiyue Huang (TU Delft, Netherlands), Lydia Y. Chen (University of Neuchâtel, Switzerland; TU Delft, Netherlands), and Stefanie Roos (RPTU Kaiserslautern, Germany)</i>	

Research #7: Blockchain 2

Enabling Complete Atomicity for Cross-Chain Applications Through Layered State Commitments	248
<i>Yuandi Cai (Huazhong University of Science and Technology, China), Ru Cheng (Huazhong University of Science and Technology, China), Yifan Zhou (Huazhong University of Science and Technology, China), Shijie Zhang (Huazhong University of Science and Technology, China), Jiang Xiao (Huazhong University of Science and Technology, China), and Hai Jin (Huazhong University of Science and Technology, China)</i>	
Fantastyc: Blockchain-Based Federated Learning Made Secure and Practical	260
<i>William Boitier (Université Paris-Saclay, CEA, List, France), Antonella Del Pozzo (Université Paris-Saclay, CEA, List, France), Álvaro García-Pérez (Université Paris-Saclay, CEA, List, France), Stephane Gazut (Université Paris-Saclay, CEA, List, France), Pierre Jolic (Université Paris-Saclay, CEA, List, France), Alexis Lemaire (Université Paris-Saclay, CEA, List, France), Erwan Mahe (Université Paris-Saclay, CEA, List, France), Aurelien Mayoue (Université Paris-Saclay, CEA, List, France), Maxence Perion (Université Paris-Saclay, CEA, List, France), Tuanir Franca Rezende (Université Paris-Saclay, CEA, List, France), Deepika Singh (Université Paris-Saclay, CEA, List, France), and Sara Tucci-Piergiovanni (Université Paris-Saclay, CEA, List, France)</i>	
PeerSwap: A Peer-Sampler with Randomness Guarantees	271
<i>Rachid Guerraoui (Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland), Anne-Marie Kermarrec (Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland), Anastasiia Kucherenko (Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland), Rafael Pinot (Sorbonne Université, France), and Martijn de Vos (Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland)</i>	

Research #8: ML & Security

CLUES: Collusive Theft of Conditional Generative Adversarial Networks	282
<i>Simon Queyrut (University of Neuchâtel, Switzerland), Valerio Schiavoni (University of Neuchâtel, Switzerland), Lydia Chen (University of Neuchâtel, Switzerland), Pascal Felber (University of Neuchâtel, Switzerland), and Robert Birke (University of Turin, Italy)</i>	
Pre-LogMGAE: Identification of Log Anomalies Using a Pre-Trained Masked Graph Autoencoder	294
<i>Aming Wu (Kyungpook National University, South Korea) and Young-Woo Kwon (Kyungpook National University, South Korea)</i>	

FedCritical: Mitigating Edge-Case Backdoor Attacks in Federated Learning	307
<i>Zhipin Gu (National University of Defense Technology, China), Jiangyong Shi (National University of Defense Technology, China), and Yuexiang Yang (National University of Defense Technology, China)</i>	

PhD Forum

PhD Forum: Towards Metastable-Failure-Free Distributed Transaction Systems	318
<i>Farzad Habibi (UC Irvine, US)</i>	
PhD Forum: Efficient Privacy-Preserving Processing via Memory-Centric Computing	322
<i>Mpoki Mwaisela (University of Neuchatel, Switzerland)</i>	
PhD Forum: Challenges of Availability and Cost Assessments for Network-Attack-Resilient Byzantine Systems	326
<i>Aren Alyahya (University of Pittsburgh, USA)</i>	
PhD Forum: Evaluating and Designing Routing Protocols for Reliable Distributed Quantum Systems	330
<i>Huzaiyah Nadeem (University of Pittsburgh, USA)</i>	

Workshop: ATSReDS

Enhancing Security and Reliability in Distributed Systems: A Hybrid Approach Integrating Snort Rules and Machine Learning for Anomaly Detection	334
<i>Vishal Murgai (F5 Inc, India), Roxy Stimpson (F5 Inc, USA), and Ravi Sankar Mantha (F5 Inc, India)</i>	
Enhanced Malware Detection in Distributed IoT Environment Using Optimized Cascaded LSTM-GRU Framework	344
<i>Akshat Gaurav (Ronin Institute, USA), Brij B. Gupta (Asia University, Taiwan), Sachin Sharma (State Bank of India, India), and Kwok Tai Chui (Hong Kong Metropolitan University, Hong Kong)</i>	
Enhancing Distributed Security and Reliability in Semiconductor Supply Chains with Blockchain and Chemistry Integration	350
<i>Sharv Murgai (The International School Bangalore, India)</i>	
Heart Failure Prediction: Machine Learning Application in Critical Care	361
<i>Himanshu Sharma (Galgotias University, India), Gitika Sharma (Bennett University, India), Sachin Sharma (State Bank of India, India), Abhijat Mishra (Galgotias University, India), Avineet Singh (Galgotias University, India), and Harshvardhan Sharma (Galgotias University, India)</i>	

Author Index	367
---------------------------	------------