

2024 14th International Workshop on Resilient Networks Design and Modeling (RNDM 2024)

**Pompei, Italy
25 – 27 November 2024**



**IEEE Catalog Number: CFP2474Y-POD
ISBN: 979-8-3315-1819-6**

**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:	CFP2474Y-POD
ISBN (Print-On-Demand):	979-8-3315-1819-6
ISBN (Online):	979-8-3315-1818-9
ISSN:	2576-3520

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

Proceedings of RNDM 2024 – Table of Contents

Technical Session – Methods for Measurement, Evaluation, or Validation of Resilience

Impact of Channel Provisioning Strategies in the Transient Resiliency of SuperC+L-band Networks

Joao Pedro (Infinera, Portugal & Instituto de Telecomunicações, Portugal); André Souza (Infinera, Portugal)...1

Computing Safest st-paths in Backbone Networks: Efficiently Solvable Cases and Fast Heuristics

Balazs Vass (Budapest University of Technology and Economics, Hungary & Babes Bolyai University, Cluj Napoca, Romania); Peter Revisnyei and Alija Pasic (Budapest University of Technology and Economics, Hungary)...8

Shared Backup Path Protection with QoT Guarantee in Elastic Optical Networks

Venkatesh Chebolu (University of Cyprus, Cyprus); Giannis Savva (KIOS CoE & University of Cyprus, Cyprus); Georgios Ellinas (University of Cyprus & KIOS Research and Innovation Center of Excellence, Cyprus)...16

Technical Session – Network Security and Sharing

Higher-Order Graph Models in Network Security

Eric Parsonage (University of Adelaide, Australia); Max Ward (The University of Western Australia, Australia); Hung Xuan Nguyen (University of Adelaide, Australia)...24

Network Sharing for Fault Resilience

Maoquan Ni, Daniela Renga and Michela Meo (Politecnico di Torino, Italy); Marco G Ajmone Marsan (IMDEA Networks Institute, Spain)...32

Simulation Study on the Impact of Variable SKR and Outdated Information in QKD Networks

Luis Boavida (University of Coimbra, INESCC, Portugal); Teresa Gomes (University of Coimbra & INESC COIMBRA, Portugal); Rita Girao-Silva (FCTUC, University of Coimbra & INESC-Coimbra, Portugal); Tim Johann (Kiel University, Germany); Daniel Giemsa (Deutsche Telekom Technik GmbH, Germany); Matthias Gunkel (Deutsche Telekom Technik GmbH & Fixed Mobile Engineering Deutschland, Germany)...39

Technical Session – Resilience of 5G+ Networked Systems

Performability Evaluation of Softwarized Multi-tenant 5G Architectures with Rejuvenation

Luigi De Simone (University of Naples Federico II, Italy); Mario Di Mauro (University of Salerno, Italy); Roberto Natella (Federico II University of Naples & Critiware, Italy); Fabio Postiglione (University of Salerno, Italy)...46

Resource Efficiency and Survivability of Network Slice Isolation Strategies after Massive Outages
Trond Vatten, Johannes Fosdal and Poul E. Heegaard (Norwegian University of Science and Technology, Norway)...52

Fronthaul Resource Optimization for Cell-Free Massive MIMO Networks
Ameya G. Joshi and Nguyen Tuan Khai (Technische Universität Chemnitz, Germany);
Thomas Bauschert (Chemnitz University of Technology, Germany)...59

Technical Session – Resilient Routing

Local Fast Failover Routing on Directed Networks
Jonas Grobe, Stephanie Althoff and Klaus-Tycho Foerster (TU Dortmund, Germany)...66

Analyzing Network Routing Resilience: A Hybrid Approach of Face and Tree Routing
Georgios Karamoussanlis, Stephanie Althoff, Erik van den Akker and Klaus-Tycho Foerster (TU Dortmund, Germany)...74

Fault-tolerant Local Recovery with Preprocessing in Multiple Shared Protection
Mengfei Zhu and Rui Kang (Kyoto University, Japan); Klaus-Tycho Foerster (TU Dortmund, Germany)...81

Keynote Talk

On the Resilience of Mutually Dependent Power and Data Networks
Hermann de Meer, Amit Dilip Patil, Michael Lechl and Anna Volkova (University of Passau, DE) ...88

Tutorial

A Tutorial on Reliable Quantum Networks
Maria Caterina D'Aloia and Christian Esposito (University of Salerno, IT) ...97