

2020 50th Annual IEEE-IFIP International Conference on Dependable Systems and Networks-Supplemental Volume (DSN-S 2020)

**Valencia, Spain
29 June - 2 July 2020**



IEEE Catalog Number: CFP20V03-POD
ISBN: 978-1-7281-7261-3

**Copyright © 2020 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:	CFP20V03-POD
ISBN (Print-On-Demand):	978-1-7281-7261-3
ISBN (Online):	978-1-7281-7260-6

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

2020 50th Annual IEEE/IFIP International Conference on Dependable Systems and Networks - Supplemental Volume (DSN-S) **DSN-S 2020**

Table of Contents

Message from Industry Track Chairs	.x
Industry Track Programme Committee	.xi
Message from the Fast Abstracts and Posters Chairs	.xii
Message from the Doctoral Forum Chairs	.xiv
Message from the Tutorials Chairs	.xv
Introduction to SELSE 2020	.xvi
Doctoral Forum Keynote	.xvii
Sponsors	.xviii

Industry Track

Session 1 - Cyber-Physical Systems and Autonomous Systems

Robustness Inside Out Testing	.1
<i>Deborah Katz (Carnegie Mellon University), Milda Zizyte (Carnegie Mellon University), Casidhe Hutchison (Carnegie Mellon University), David Guttendorf (Carnegie Mellon University), Patrick Lanigan (Carnegie Mellon University), Eric Sample (Carnegie Mellon University), Philip Koopman (Carnegie Mellon University), Michael Wagner (Edge Case Research), and Claire Le Goues (Carnegie Mellon University)</i>	
Towards Host Intrusion Detection for Embedded Industrial Systems	.5
<i>Marine Kadar (SYSGO GmbH), Sergey Tverdyshev (SYSGO GmbH), and Gerhard Fohler (TU Kaiserslautern)</i>	
The Monitor as Key Architecture Element for Safe Self-Driving Cars	.9
<i>Ayhan Mehmed (TTTech Auto AG), Moritz Antlanger (TTTech Auto AG), and Wilfried Steiner (TTTech Computertechnik AG)</i>	

Session 2 - ML For Dependable and Secure Systems

Predicting Remediations for Hardware Failures in Large-Scale Datacenters .13.....	
<i>Fred Lin (Facebook Inc.), Antonio Davoli (Facebook Inc.), Imran Akbar (Facebook Inc.), Sukumar Kalmanje (Facebook Inc.), Leandro Silva (Facebook Inc.), John Stamford (Facebook Inc.), Yanai Golany (Facebook Inc.), Jim Piazza (Facebook Inc.), and Sriram Sankar (Facebook Inc.)</i>	
ZTE-Predictor: Disk Failure Prediction System Based on LSTM .17.....	
<i>Hongzhang Yang (Peking University, China; ZTE Corporation, China), Zongzhao Li (ZTE Corporation, China), Huiyuan Qiang (ZTE Corporation, China), Zhongliang Li (ZTE Corporation, China), Yaofeng Tu (ZTE Corporation, China), and Yahui Yang (Peking University, China)</i>	
Neuraltran: Optimal Data Transformation for Privacy-Preserving Machine Learning by Leveraging Neural Networks .21.....	
<i>Changchang Liu (IBM T. J. Watson Research Center), Wei-Han Lee (IBM T. J. Watson Research Center), and Seraphin Calo (IBM T. J. Watson Research Center)</i>	

Session 3 - Networks

Simulating Reliability of IoT Networks with RelIoT .25.....	
<i>Kazim Ergun (University of California San Diego), Xiaofan Yu (University of California San Diego), Nitish Nagesh (University of California San Diego), Ludmila Cherkasova (Arm Research), Pietro Mercati (Intel Corporation), Raid Ayoub (Intel Corporation), and Tajana Rosing (University of California San Diego)</i>	
Performance-Aware Wi-Fi Problem Diagnosis and Mitigation through Peer-to-Peer Data Sharing.29	
<i>Nathan Mickulicz (YinzCam, Inc.) and Priya Narasimhan (Carnegie Mellon University)</i>	

Session 4 - Panel

Session 5 - Modelling and Knowledge Representation

Fundamental Challenges of Cyber-Physical Systems Security Modeling .33.....	
<i>Georgios Bakirtzis (University of Virginia), Garrett Ward (Honeywell International Inc), Christopher Deloglos (Virginia Commonwealth University), Carl Elks (Virginia Commonwealth University), Barry Horowitz (University of Virginia), and Cody Fleming (University of Virginia)</i>	
Ontology Configuration Management for Knowledge-Centric Systems Engineering in Industry .37...	
<i>Borja Lopez (The REUSE Company), Jose Maria Alvarez-Rodriguez (Universidad Carlos III de Madrid), Eugenio Parra (Universidad Carlos III de Madrid), and Jose Luis de la Vara (Universidad de Castilla-La Mancha)</i>	

Fast Abstracts

Session 1

Secure Consensus Generation with Distributed DoH .41.....

Philipp Jeitner (Technical University of Darmstadt), Haya Shulman (Fraunhofer Institute for Secure Information Technology SIT), and Michael Waidner (Fraunhofer Institute for Secure Information Technology SIT)

Design and Performance Analysis of Software Defined Networking Based Web Services Adopting Moving Target Defense .43.....

Dong Seong Kim (University of Queensland Brisbane, Australia), Minjune Kim (University of Queensland), Jin-Hee Cho (Virginia Tech), Hyuk Lim (Gwangju Institute of Science & Technology), Terrence J. Moore (Army Research Lab.), and Frederica F. Nelson (Army Research Lab.)

Tomographic Measuring Sensors System for Analysis and Visualization of Technological Processes .45.....

Mariusz Mazurek (Institute of Philosophy and Sociology of the Polish Academy of Sciences Warsaw, Poland), Tomasz Rymarczyk (R&D Center Netrix S.A. Lublin & University of Economics and Innovation in Lublin Lublin, Poland), Grzegorz Kłosowski (Lublin University of Technology Lublin Lublin, Poland), Michał Maj (R&D Center Netrix S.A. Lublin & University of Economics and Innovation in Lublin Lublin, Poland), and Przemysław Adamkiewicz (R&D Center Netrix S.A. Lublin & University of Economics and Innovation in Lublin Lublin, Poland)

Session 2

MPC for Securing Internet Infrastructure .47.....

Kris Shrishak (Technical University of Darmstadt) and Haya Shulman (Fraunhofer Institute for Secure Information Technology SIT)

Pitfalls of Provably Secure Systems in Internet the Case of Chronos-NTP .49.....

Philipp Jeitner (Technical University of Darmstadt), Haya Shulman (Fraunhofer Institute for Secure Information Technology SIT), and Michael Waidner (Fraunhofer Institute for Secure Information Technology SIT)

SIMBA: An Efficient Simulator for Blockchain Applications .51.....

Seyed Mehdi Fattah (New York Institute of Technology, Vancouver, Canada), Adetokunbo Makarju (New York Institute of Technology, Vancouver, Canada), and Amin Milani Fard (New York Institute of Technology, Vancouver, Canada)

Session 3

Fault Tree Analysis: Identifying Maximum Probability Minimal Cut Sets with MaxSAT .53.....

Martín Barrère (Imperial College London) and Chris Hankin (Imperial College London)

Impact of Coding Styles on Behaviours of Static Analysis Tools for Web Applications .55.....	
<i>Ibéria Medeiros (LASIGE, Faculdade de Ciências da Universidade de Lisboa) and Nuno Neves (LASIGE, Faculdade de Ciências da Universidade de Lisboa)</i>	
A Novel Graphical Security Model for Evolving Cyber Attacks in Internet of Things .57.....	
<i>Dong Seong Kim (The University of Queensland), Kok Onn Chee (The University of Queensland), and Mengmeng Ge (Deakin University)</i>	

Session 4

The Effect of Motion on PPG Heart Rate Sensors .59.....	
<i>Daniel Hu (Purdue University), Calvin Henry (Purdue University), and Saurabh Bagchi (Purdue University)</i>	
Reliability Analysis of Edge Scenarios Using Pedestrian Mobility .61.....	
<i>Kshitiz Goel (Purdue University), Abhishek Bhaumick (Purdue University), Deepika Kaushal (Purdue University), and Saurabh Bagchi (Purdue University)</i>	
Improving the Dependability of the ECG Signal for Classification of Heart Diseases .63.....	
<i>Bartosz Przysucha (Lublin University of Technology, Poland), Tomasz Rymarczyk (Research and Development Center Netrix S.A., University of Economics and Innovation in Lublin, Poland), Dariusz Wójcik (Research and Development Center Netrix S.A., Lublin, Poland), Michał Wos (Research and Development Center Netrix S.A., Lublin, Poland), and Andrzej Vejar (Research and Development Center Netrix S.A., University of Economics and Innovation in Lublin, Poland)</i>	

Doctoral Forum

Session 1

Safeguarding Data Consistency at the Edge .65.....	
<i>Cláudio Correia (INESC-ID, Instituto Superior Técnico, Universidade de Lisboa)</i>	
Depending on HTTP/2 for Privacy? Good Luck! .67.....	
<i>Gargi Mitra (IIT Madras)</i>	
Towards Practical Privacy-Preserving Collaborative Machine Learning at a Scale .69.....	
<i>Rania Talbi (INSA-Lyon, LIRIS)</i>	

Session 2

What Exactly Determines the Type? Inferring Types with Context .71.....	
<i>Ligeng Chen (Nanjing University)</i>	
Impact of Geo-Distribution and Mining Pools on Blockchains: A Study of Ethereum - Practical Experience Report and Ongoing PhD Work .73.....	
<i>Paulo Silva (IST/University of Lisbon)</i>	

CanvasMirror: Secure Integration of Third-Party Libraries in a WebVR Environment	.75.....
<i>Jiyeon Lee (KAIST)</i>	
A Framework for Risk Assessment in Augmented Reality-Equipped Socio-Technical Systems	.77....
<i>Soheila Sheikh Bahaei (Mälardalen University)</i>	

Tutorials

Cross-Layer Soft-Error Resilience Analysis of Computing Systems	.79.....
<i>Alberto Bosio (École Centrale de Lyon – INL), Ramon Canal (Universitat Politècnica de Catalunya and Barcelona Supercomputing Center), Stefano Di Carlo (Politecnico di Torino), Dimitris Gizopoulos (University of Athens), and Alessandro Savino (Politecnico di Torino)</i>	
The InterPlanetary File System and the Filecoin Network	.80.....
<i>Yiannis Psaras (Protocol Labs) and David Dias (Protocol Labs)</i>	
Into the Unknown: Unsupervised Machine Learning Algorithms for Anomaly-Based Intrusion Detection	.81.....
<i>Tommaso Zoppi (University of Florence), Andrea Ceccarelli (University of Florence), and Andrea Bondavalli (University of Florence)</i>	

Best of SELSE

Software-Only Triple Diverse Redundancy on GPUs for Autonomous Driving Platforms	.82.....
<i>Sergi Alcaide Portet (Universitat Politècnica de Catalunya - Barcelona Supercomputing Center), Leonidas Kosmidis (Universitat Politècnica de Catalunya - Barcelona Supercomputing Center), Carles Hernandez (Universitat Politècnica de València - Barcelona Supercomputing Center), and Jaume Abella (Barcelona Supercomputing Center)</i>	
A Machine Learning-Based Error Model of Voltage-Scaled Circuits	.89.....
<i>Dongning Ma (Villanova University) and Xun Jiao (Villanova University)</i>	
An Overview of the Risk Posed by Thermal Neutrons to the Reliability of Computing Devices	.92....
<i>Daniel Oliveira (UFPR), Sean Blanchard (Los Alamos National Laboratory), Nathan DeBardeleben (Los Alamos National Laboratory), Fernando Santos (UFRGS), Gabriel Dávila (UFRGS), Philippe Navaux (UFRGS), Stephen Wender (Los Alamos National Laboratory), Carlo Cazzaniga (STFC), Christopher Frost (STFC), Robert Baumann (Radiosity Solutions), and Paolo Rech (UFRGS / Los Alamos National Laboratory)</i>	

Author Index 99
------------------------	-------