2023 IEEE 28th Pacific Rim International Symposium on Dependable Computing (PRDC 2023)

Singapore 24-27 October 2023



IEEE Catalog Number: ISBN:

CFP23245-POD 979-8-3503-5877-3

Copyright © 2023 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:
 CFP23245-POD

 ISBN (Print-On-Demand):
 979-8-3503-5877-3

 ISBN (Online):
 979-8-3503-5876-6

ISSN: 1555-094X

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



2023 IEEE 28th Pacific Rim International Symposium on Dependable Computing (PRDC) PRDC 2023

Table of Contents

Message from the General Chairs xi Message from the Program Chairs xi Organizing Committee xi Program Committee xi Sponsors xvii	i v
Security & Safety	
An Empirical Analysis of Rebalancing Methods for Security Issue Report Identification	1
ecCT: Secure and Scalable Count Query Models on Encrypted Genomic Data	3
imulation-Based Evaluation of a Remotely Operated Road Vehicle Under Transmission Delays and Denial-of-Service Attacks	3
Efficient Adversarial Input Generation via Neural Net Patching)
ntrusion Detection for Scalable and Elastic Microservice Applications)

Attack Tree Analysis for Adversarial Evasion Attacks
Networking
A Blockchain-Based Interoperable Architecture for IoT with Selective Disclosure of Information
Discovery of Flow Splitting Ratios in ISP Networks with Measurement Noise
A Network Agnostic Approach To Enforcing Collision-Free Time-Triggered Communication71 Mohammad Ibrahim Alkoudsi (RPTU Kaiserslautern-Landau, Germany), Gerhard Fohler (RPTU Kaiserslautern-Landau, Germany), and Marcus Völp (SnT - Université du Luxembourg, Luxembourg)
Industry Talks
Perceived Usability of Computer-Aided Engineering Software
Extension of STPA to Analyze Decisions and Behaviors of Human as Controlled Process in Human-Machine Coexistence Environment
System & Data Dependability
SEmigrate: Optimizing Data Protection with VM Introspection
Development of the System Assurance Reference Model for Generating Modular Assurance Cases 99 Andrzej Wardzinski (Argevide, Poland) and Aleksander Jarzebowicz (Gdansk University of Technology, Poland)

DTR: Accurate and Efficient Proof of Timely-Retrievability for Storage Systems	.11
ead Time Analysis for UAVs' Failure Prediction in U-Space	23
nd-to-end Resiliency Analysis Framework for Cloud Storage Services	34
heories	
pplying Metamorphic Testing to Reliability Calculating Programs	.42
MAHA: Opportunistic Message Aggregation for pHase-Based Algorithms	50
SGAT: A Graph Attention Network for Binary Code Similarity Detection	61
veness Checking of the HotStuff Protocol Family	.68
calable Performance Evaluation of Byzantine Fault-Tolerant Systems Using Network mulation	.80
ata-Flow-Based Normalization Generation Algorithm of R1CS for Zero-Knowledge Proof	91

Applications

I Can't Escape Myself: Cloud Inter-Processor Attestation and Sealing using Intel SGX Daniel Andrade (INESC-ID, Instituto Superior Técnico, Universidade de Lisboa, Portugal), João Nuno Silva (INESC-ID, Instituto Superior Técnico, Universidade de Lisboa, Portugal), and Miguel Correia (INESC-ID, Instituto Superior Técnico, Universidade de Lisboa, Portugal)	190
AdapTV+: Enhancing Model-Based Test Adaptation for Smart TVs through Icon Recognition Mohammad Yusaf Azimi (Sabanci University, Turkey) and Cemal Yilmaz (Sabanci University, Turkey)	209
A Machine Learning Driven Fault Tolerance Mechanism for UAVs' Flight Controller	217
Entropy-Based Selective Homomorphic Encryption for Smart Metering Systems	228
Fast Abstracts	
Formal Verification of Concurrent Algorithms: Case Studies on Mutual Exclusion	236
Safeguarding Learning-Based Control for Smart Energy Systems with Sampling Specifications Chih-Hong Cheng (Fraunhofer IKS, Germany), Venkatesh Prasad Venkataramanan (Fraunhofer IKS, Germany), Pragya Kirti Gupta (Fraunhofer IKS, Germany), Yun-Fei Hsu (Fraunhofer IKS, Germany), and Simon Burton (Fraunhofer IKS, Germany)	239
How to Attract and Retain Users for Native Newborn Version Control Systems?	242

Utilizing Similarity for Improved Intrusion Detection: Autonomous Community Formation for Practical Heterogeneity Management Philipp Eichhammer (University of Passau, Germany) and Hans P. Reiser (Reykjavik University, Iceland)	247
Reliability	
VISILIENCE: An Interactive Visualization Framework for Resilience Analysis Using Control-Flow Graph	250
Using Multi-Dimensional Quorums for Optimal Resilience in Multi-Resource Blockchains	257
Hierarchical Dependability Modeling with Multi-State Systems	268
Reliability and Performance Evaluation of Two-Input Machine Learning Systems	278
ISACE 2023 - Session 1	
Evaluating of Football Player 1v1 Abilities Based on the Glicko-2 with Modifications	. 287
Perspectives of Pakistani Cricketers and Coaches Regarding Coaching Competence in Relation to Performance Efficacy	292
Officiating Cricket Bowling Using An Event-Based Computer Vision System Masoumeh Izadi (TVConal, Singapore), Ehsan Goodarzi (TVConal, Singapore), Milad Farzalizadeh (TVConal, Singapore), Masoud Masoumi Moghadam (TVConal, Singapore), and Aleksey Izmailov (TVConal, Singapore)	.299
Sports Injury Prediction in Professional Tennis	304

Effects of Wrist Guard Microcurrent Stimulation Therapy on Pain, Range of Motion, and Muscle Strength in Physically Active Older Women with Carpal Tunnel Syndrome	309
A Dynamic Online Dashboard for Tracking the Performance of Division 1 Basketball Athletic Performance Erica Juliano (Sacred Heart University, USA), Chelsea Thakkar (Sacred Heart University, USA), Christopher Taber (Sacred Heart University, USA), Mehul Raval (Ahmedabad University, India), Tolga Kaya (Sacred Heart University, USA), and Samah Senbel (Sacred Heart University, USA) USA)	314
ISACE 2023 - Session 2	
Shifting the Weight: Applications of AI in Olympic Weightlifting Daniel Bolarinwa (University of East London, United Kingdom), Nadeem Qazi (University of East London, United Kingdom), and Mustansar Ghazanfar (University East London, United Kingdom)	319
A Framework for Biomechanical Analysis of Jump Landings for Injury Risk Assessment	327
Probabilistic Model Checking of Handball Action Sequences <i>Luke Wildman (Brisbane Handball Club, Australia)</i>	332
Recognizing a Sequence of Events from Tennis Video Clips: Addressing Timestep Identification and Subtle Class Differences Zhaoyu Liu (National University of Singapore, Singapore), Jingyu Guo (National University of Singapore, Singapore), Mo Wang (National University of Singapore, Singapore), Ruicong Wang (National University of Singapore, Singapore), Kan Jiang (National University of Singapore, Singapore), and Jin Song Dong (National University of Singapore, Singapore)	337
Court Detection Using Masked Perspective Fields Network Kan Jiang (National University of Singapore), Jiayu Li (National University of Singapore), Zhaoyu Liu (National University of Singapore), and Chen Dong (Louisiana State University)	342
ISACE 2023 - Session 3	
Early Childhood Action Monitoring and Analytics System (ECAMS) Isuru Supasan Naotunna Andarage (Sri Lanka Technological Campus, Sri Lanka), Dileepa Fernando (Nanyang Technological University, Singapore), Buddhi Avishka Lokuarachchi (Sri Lanka Technological Campus, Sri Lanka), Malithi Gimhani Athuluwage (Sri Lanka Technological Campus, Sri Lanka), and Pavithra Wijewickrama (Sabaragamuwa University of Sri Lanka, Sri Lanka)	346

RaceLens: A Machine Intelligence-Based Application for Racing Photo Analysis	352
Andrei Boiarov (Constructor Technology, Switzerland), Dmitry Bleklov	
(Constructor Technology, Switzerland), Pavlo Bredikhin (Constructor	
Technology, Switzerland), Nikita Koritsky (Constructor Technology,	
Switzerland), and Sergey Ulasen (Constructor Technology, Switzerland)	
Key Considerations in the Week-to-Week Forecasting of Individual Match Actions in Football	356
Author Index	361