

2025 20th European Dependable Computing Conference Companion Proceedings (EDCC-C 2025)

**Lisbon, Portugal
8-11 April 2025**



**IEEE Catalog Number: CFP250P5-POD
ISBN: 979-8-3315-3742-5**

**Copyright © 2025 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:	CFP250P5-POD
ISBN (Print-On-Demand):	979-8-3315-3742-5
ISBN (Online):	979-8-3315-3741-8

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

2025 20th European Dependable Computing Conference Companion Proceedings (EDCC-C) **EDCC-C 2025**

Table of Contents

Message from the General Chair	xii
Message from the Fast Abstracts Chair	xiv
Message from the Student Forum Chair	xv
Message from the Workshops Chair	xvi
Message from the AI4RAILS Workshop Chairs	xix
Message from the DepWeb3 Workshop Chairs	xxi
Message from the SafeAutonomy Workshop Chairs	xxiii
Message from the U-Space Workshop Chairs	xxv
Sponsors and Supporters	xxvii

Fast Abstracts

AI-Generated Distributed Algorithms: Paving the Way for More Dependable Distributed Systems	1
<i>Diogo Vaz (Universidade de Lisboa – Lisbon, Portugal), David R. Matos (Universidade de Lisboa – Lisbon, Portugal), Miguel L. Pardal (Universidade de Lisboa – Lisbon, Portugal), and Miguel Correia (Universidade de Lisboa – Lisbon, Portugal)</i>	
Large Language Models for Explainable Threat Intelligence	3
<i>Tiago Dinis (Universidade de Lisboa - Lisboa, Portugal), Roger Tavares (UON - Lisboa, Portugal), and Miguel Correia (Universidade de Lisboa - Lisboa, Portugal)</i>	
Towards a Reliable Orchestration of Containerised Critical Services	5
<i>Ana Luis (Universidade de Lisboa), Alysson Bessani (Universidade de Lisboa), and Vinicius V. Cogo (Universidade de Lisboa)</i>	
Blockchain Infrastructure and Web Application for Dematerialization of Promissory Notes	7
<i>Henrique Silvo (INESC-ID, Portugal), Filipe Quina (INESC-ID, Portugal), Sérgio Guerreiro (Universidade de Lisboa, Portugal; INESC-ID, Portugal), and Miguel Matos (Universidade de Lisboa, Portugal; INESC-ID, Portugal)</i>	
Improving the Efficiency of Multi-Cloud Storage	11
<i>Guilherme Santos (Universidade de Lisboa, Portugal) and Alysson Bessani (Universidade de Lisboa, Portugal)</i>	

BLADE - Byzantine-Tolerant Learning under an Asynchronous and Decentralized Environment	14
<i>Goçalo Ferreira (U. Minho and INESCTEC, Portugal), Ana Nunes Alonso (U. Minho and INESCTEC, Portugal), and José Pereira (U. Minho and INESCTEC, Portugal)</i>	
Improving Availability in Event Sourcing Systems	18
<i>Tiago Rolo (University of Coimbra, Portugal), Nuno Preguiça (NOVA University Lisboa, Portugal), and Filipe Araujo (University of Coimbra, Portugal)</i>	
Towards SW-Based Robustness Assessment of HW Accelerators for Quantized CNNs	22
<i>Juan Carlos Ruiz (ITACA - Universitat Politècnica de València (UPV), Spain), David de Andrés (ITACA - Universitat Politècnica de València (UPV), Spain), Luis José Saiz-Adalid (ITACA - Universitat Politècnica de València (UPV), Spain), and Joaquín Gracia-Morán (ITACA - Universitat Politècnica de València (UPV), Spain)</i>	
Initial Insights into Synthesis Overheads Caused by C-Based Error Correction Codes Implementations	26
<i>Joaquín Gracia-Morán (Universitat Politècnica de València, Spain), David de Andrés (Universitat Politècnica de València, Spain), Luis-J. Saiz-Adalid (Universitat Politècnica de València, Spain), Juan Carlos Ruiz (Universitat Politècnica de València, Spain), J.-Carlos Baraza-Calvo (Universitat Politècnica de València, Spain), Daniel Gil-Tomás (Universitat Politècnica de València, Spain), and Pedro J. Gil-Vicente (Universitat Politècnica de València, Spain)</i>	
Compact Two-Dimensional RAID Level 6 Arrays Tolerating Quadruple Node Failures	30
<i>Jehan-François Paris (Uniniversity of Houston, USA) and Thomas Schwarz (Marquette University, USA)</i>	
Towards a Novel 8-Bit Floating-Point Format to Increase Robustness in Convolutional Neural Networks	34
<i>Luis-J. Saiz Adalid (Universitat Politècnica de València (UPV), Spain), Juan-Carlos Ruiz-García (Universitat Politècnica de València (UPV), Spain), Joaquín Gracia-Morán (Universitat Politècnica de València (UPV), Spain), David de Andrés (Universitat Politècnica de València (UPV), Spain), J.-Carlos Baraza-Calvo (Universitat Politècnica de València (UPV), Spain), Daniel Gil-Tomás (Universitat Politècnica de València (UPV), Spain), and Pedro Gil-Vicente (Universitat Politècnica de València (UPV), Spain)</i>	
Exploring Complementarity between Functional Safety and Cybersecurity in the Chemical Process Industry	38
<i>Geert Deconinck (KU Leuven, Belgium), Jan Luyts (BASF, Belgium), and Geert Boogaerts (KU Leuven, Belgium)</i>	

Student Forum

Let It Glow: Illuminating Middleboxes with NoPASARAN	40
<i>Ilies Benhabbour (King Abdullah University of Science and Technology, Kingdom of Saudi Arabia) and Marc Dacier (King Abdullah University of Science and Technology, Kingdom of Saudi Arabia)</i>	

Machine Learning-Based Distributed Intrusion Detection System in Industrial Edge Environments: Challenge Identification	44
<i>Zihao Deng (KU Leuven, Belgium) and Geert Deconinck (KU Leuven, Belgium)</i>	
Methodology for Vulnerabilities Detection in IoT Gateways Source Code	48
<i>Diego R. Gomes (University of Coimbra, Portugal)</i>	
Security Evaluation of Smart Home Devices Based on the OWASP Top 10 IoT Vulnerabilities	52
<i>Eduardo F. Felix (University of Coimbra, Portugal)</i>	
Towards Real-Time Malware Classification Through Honeypot Analysis	56
<i>Miguel Fáisco (Universidade de Lisboa, Portugal; Reykjavik University, Iceland), Ibéria Medeiros (Universidade de Lisboa, Portugal), and Hans P. Reiser (Reykjavik University, Reykjavik, Iceland)</i>	
Benchmarking LLM Robustness Against Prompt-Based Adversarial Attacks	60
<i>João Donato (University of Coimbra, Portugal)</i>	
Benchmarking Large Language Models for Code Generation	64
<i>Rodrigo Pato Nogueira (University of Coimbra, Portugal)</i>	
Processing Web Applications using NLP for Vulnerability Identification	68
<i>Jorge Guerreiro (Universidade de Lisboa, Portugal) and Ibéria Medeiros (Universidade de Lisboa, Portugal)</i>	
Software Trustworthiness Assessment via Large Language Models (LLMs)	72
<i>Saeed Javani Jananloo (University of Coimbra, Portugal)</i>	
Empowering Individual Climate Action Through Carbon Tokenization	76
<i>Umair S. Siddiqui (NOVA Information Management School, Portugal), Joana R. Pereira (NOVA Information Management School, Portugal), Ian J. Scott (NOVA Information Management School, Portugal), Miguel C. Neto (NOVA Information Management School, Portugal), and Francisco Gallego (ToolPor LDA, Portugal)</i>	

AI4RAILS Workshop

AI for Railway Safety and Security

Novel Use of EO Satellite Data and AI in Railways: A Concept for Rail Buckling Risk Estimation in the SPATRA Project	80
<i>Danijela Ristić-Durrant (OHB Digital Services GmbH, Germany), Milan Banić (University of Niš, Serbia), Milan Trifunović (University of Niš, Serbia), Alina Klapper (OHB Digital Services GmbH, Germany), Miloš Madić (University of Niš, Serbia), Aleksandar Trajković (University of Niš, Serbia), Dietrich Kuhn (OHB Digital Services GmbH, Germany), and Miloš Simonović (University of Niš, Serbia)</i>	
A Traffic Evacuation Model for Enhancing Resilience During Railway Disruption	84
<i>Hangli Ge (The University of Tokyo, Japan), Xiaojie Yang (The University of Tokyo, Japan), Jinyu Chen (The University of Tokyo, Japan), Francesco Flammini (University of Florence, Italy; University of Applied Sciences and Arts of Southern Switzerland, Switzerland), and Noboru Koshizuka (The University of Tokyo, Japan)</i>	

ESSecA Expert System for Automated Penetration Testing: the Train Control and Monitoring System Case Study	90
<i>Alessandra De Benedictis (University of Naples Federico II, Italy), Massimiliano Rak (University of Naples Federico II, Italy), Emanuele Agostino Messuri (University of Naples Federico II, Italy), Felice Moretta (University of Campania Luigi Vanvitelli, Italy), and Augusto Ausanio (Hitachi Rail Italy S.p.A., Italy)</i>	

AI for Railway Logistics and Maintenance

A Single AI Platform for the Unification of Railway Transport Logistics Processes	96
<i>Oleksandr Rohovyi (State University of Infrastructure and Technologies, Ukraine), Valerii Samsonkin (State University of Infrastructure and Technologies, Ukraine), Oksana Yurchenko (State University of Infrastructure and Technologies, Ukraine), and Gintautas Bureika (Vilnius Gediminas Technical University, Lithuania)</i>	
The Impact of Artificial Intelligence on Passenger Flow in Air and Rail Integrated Networks: A Systematic Literature Review	102
<i>Nandhini Mahesh (Aston University, UK), Reem Hadeed (Aston University, UK), and Marin Marinov (Aston University, UK)</i>	
Synchronisation of On-Board Track Geometry Monitoring Signals to Enable Machine Learning Predictions	108
<i>Sepehr Abdi Goudarzi (Sapienza University of Rome, Italy), Riccardo Licciardello (Sapienza University of Rome, Italy), Nadia Kaviani (Sapienza University of Rome, Italy), Shahab Aldin Mansouri (Sapienza University of Rome, Italy), and Mani Entezami (University of Birmingham, United Kingdom)</i>	

AI for Railway Engineering and Innovation

An Integrated AI and Model-Based Approach for Railway Cyber-Physical Systems	113
<i>Arianna Nocente (University of Pisa, Italy; Alstom Ferroviaria Spa, Italy), Gabriele Pannocchia (University of Pisa, Italy), and Giulio Rossetti (CNR-ISTI, Italy)</i>	
Harnessing Explainable AI in Railway: A Decision Tree-Based Approach	119
<i>Mario Barbareschi (University of Naples Federico II, Italy), Antonio Emmanuele (University of Naples Federico II, Italy), Nicola Mazzocca (University of Naples Federico II, Italy), and Franca Rocco di Torrepadula (University of Naples Federico II, Italy)</i>	
Leveraging AI to Transform Rail Higher Education: Opportunities, Challenges, and the Path Forward	125
<i>Prachiti Shinde (Aston University, UK), Marin Marinov (Aston University, UK), and Reem Hadeed (Aston University, UK)</i>	

DepWeb3 Workshop

Cross-Chain Interoperability

Evaluating the Impact of Cross-Chain Deployment on Dapps' Market Performance in Web3 Ecosystems	130
<i>Joana R. Pereira (Nova Information Management School, Portugal; Leeds University Business School, United Kingdom)</i>	
Handling Assets in the Secure Asset Transfer Protocol - One Schema to Handle Them All (Position Paper)	133
<i>Rodolfo Carapau (Universidade de Lisboa - Lisbon, Portugal), André Augusto (Universidade de Lisboa - Lisbon, Portugal), André Vasconcelos (Universidade de Lisboa - Lisbon, Portugal), and Miguel Correia (Universidade de Lisboa - Lisbon, Portugal)</i>	
Visualization of Cross-Chain Transactions for Secure Blockchain Interoperability (Position Paper)	139
<i>Jorge Santos (Universidade de Lisboa - Lisbon, Portugal), André Augusto (Universidade de Lisboa - Lisbon, Portugal), André Vasconcelos (Universidade de Lisboa - Lisbon, Portugal), and Miguel Correia (Universidade de Lisboa - Lisbon, Portugal)</i>	

Decentralized Finance

Reliability is Blind: Collective Incentives for Decentralized Computing Marketplaces without Individual Behavior Information	145
<i>Henry Mont (LIRIS-DRIM INSA Lyon, France), Matthieu Bettinger (LIRIS-DRIM INSA Lyon, France), Sonia Ben Mokhtar (LIRIS-DRIM CNRS, France), and Anthony Simonet-Boulogne (iExec Blockchain Tech, France)</i>	
What Must the Price in Decentralized Exchanges Be?	151
<i>Hyoung Joong Kim (Kookmin University, Korea), Gyu M. Lee (Pusan National University, Korea), Jongwon Lee (Hoseo University, Korea), Sora Kang (Hoseo University, Korea), Seong Wook Chae (Hoseo University, Korea), and Jun-Seok Park (Kookmin University, Korea)</i>	
A Decentralized Marketplace for Tokenized Real Estate	157
<i>Duarte Costa (Universidade de Lisboa - Lisbon, Portugal), João Santos (Unlockit - Lisbon, Portugal), Tiago Dias (Unlockit - Lisbon, Portugal), and Miguel Correia (Universidade de Lisboa - Lisbon, Portugal)</i>	

Blockchain Applications

Dependable Food Traceability Data through Blockchain and Database Integration	163
<i>Lourenço Preto (Universidade de Lisboa, Portugal), Samih Eisa (Universidade de Lisboa, Portugal), Orlando Remédios (Sensefinito, Portugal), David R. Matos (Universidade de Lisboa, Portugal), and Miguel L. Pardal (Universidade de Lisboa, Portugal)</i>	

ChainGuard: Verified Data Intake for a Track & Trace Blockchain	168
<i>André Avelar (Universidade de Lisboa, Portugal), Samih Eisa (Universidade de Lisboa, Portugal), Orlando Remédios (Sensefinitly, Portugal), and Miguel L. Pardal (Universidade de Lisboa, Portugal)</i>	
A Decentralized Architecture for Electronic Health Records to Enhanced Security and Privacy	174
<i>Rodrigo Tertulino (University of Coimbra, Portugal), Fernando Vidal (University of Coimbra, Portugal), and Naghmeh Ivaki (University of Coimbra, Portugal)</i>	
Web 3 Data Matching for Blockchain-Supported Real Estate (position paper)	180
<i>Henrique Lin (Universidade de Lisboa - Lisbon, Portugal), João Santos (Unlockit - Lisbon, Portugal), Tiago Dias (Unlockit - Lisbon, Portugal), and Miguel Correia (Universidade de Lisboa - Lisbon, Portugal)</i>	

SafeAutonomy Workshop

AI Safety

On the Meaning of AI Safety	185
<i>Ibrahim Habli (University of York, United Kingdom)</i>	
Unified AI-Product Lifecycle Based on Road-Vehicle Safety Standards	189
<i>Shanza Ali Zafar (Fraunhofer IKS, Germany), Jessica Kelly (Fraunhofer IKS, Germany), and Núria Mata (Fraunhofer IKS, Germany)</i>	

SafeAutonomy Architectures and Frameworks

A Five-Dimensional Digital Twin Architecture for Real-Time and Non Real-Time Safety Assurance of Autonomous Systems	195
<i>Laure Buysse (KU Leuven, Belgium; Flanders Make @ KU Leuven, Belgium), Dries Vanoost (KU Leuven, Belgium; Flanders Make @ KU Leuven, Belgium), Jeroen Boydens (KU Leuven, Belgium), and Davy Pissoort (KU Leuven, Belgium; Flanders Make @ KU Leuven, Belgium)</i>	
A Dependable Trajectory Prediction Pipeline for Autonomous Driving: Integrating Computer Vision and Bayesian Networks for Highway Safety	201
<i>Sanjana Range Gowda (RPTU Kaiserslautern-Landau, Germany) and Patrick Wolf (Fraunhofer IESE, Germany)</i>	
Enhancing Safety and Performance of Autonomous Systems in Open Contexts Through the Layers of Protection Architecture (LOPAAS)	207
<i>Patrick Wolf (Fraunhofer IESE, Germany) and Rasmus Adler (Fraunhofer IESE, Germany)</i>	

Safety-Related Concerns

A Modular Architecture Template for Resource Modeling in Software-Defined Vehicles 213
Patrick Uven (German Aerospace Center (DLR), Germany), Ralf Stemmer (German Aerospace Center (DLR), Germany), and Gregor Nitsche (German Aerospace Center (DLR), Germany)

U-Space Workshop

Bringing Independent Cybersecurity Assessments to Space Systems 218
Nuno Silva (Critical Software, S.A., Portugal), Gustavo Dinis (Critical Software, S.A., Portugal), Mauro Gameiro (Critical Software, S.A., Portugal), and João Gaspar (Critical Software, S.A., Portugal)

Author Index 225