

**2021 IEEE/ACM 25th
International Symposium on
Distributed Simulation and Real
Time Applications (DS-RT 2021)**

**Virtual Conference
27-29 September 2021**



IEEE Catalog Number: CFP21186-POD
ISBN: 978-1-6654-3327-3

**Copyright © 2021 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:	CFP21186-POD
ISBN (Print-On-Demand):	978-1-6654-3327-3
ISBN (Online):	978-1-6654-3326-6
ISSN:	1550-6525

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

Table of Contents

Session 1 : Modeling and Simulation in Urban Environment

- 1 [Low-latency GNSS multipath simulator for real-time applications in autonomous driving](#)
Marcus O'Connor (Leibniz University of Hannover, Germany); Fabian Ruwisch (Institut für Erdmessung, Leibniz Universität Hannover, Germany); Tobias Kersten (Leibniz Universität Hannover, Germany); Christian Skupin (Robert Bosch GmbH, Germany); Le Ren and Temmo Wuebbena (Geo++ GmbH Garbsen, Germany); Steffen Schön (Leibniz Universität Hannover, Germany)
- 10 [Methodology for Assessing of Communication Protocols for Distributed Simulation of Road Traffic](#)
Tomas Potuzak (University of West Bohemia, Czech Republic)
- 20 [A Toolkit for Visualizing V2X Messages on the Smart Highway Testbed](#)
Erik de Britto e Silva (University of Antwerp & Imec - Fondazione Bruno Kessler, Belgium); Jaimie Vranckx, Tom De bruyn and Vincent Charpentier (University of Antwerp, Belgium); Seilendria A. Hadiwardoyo (University of Antwerp & IMEC, Belgium); Johann M. Marquez-Barja (University of Antwerpen & imec, Belgium)
- 24 [Towards an immersive visualization of consumer-level simulations of vehicular traffic](#)
Lorenzo Donatiello (Università di Bologna, Italy); Lorenzo Gasparini (University of Bologna, Italy); Gustavo Marfia (Università di Bologna, Italy)
- 28 [Cloudlet Dwell Time Model and Resource Availability for Vehicular Fog Computing](#)
Md Tahmid Hossain and Robson E. De Grande (Brock University, Canada)

Session 2 : Scheduling & Simulations

- 36 [Design and evaluation of update schemes to optimize asynchronous Cellular Automata with random or cyclic orders](#)
Junjiang Li (Miami University, USA); Till Köster (University of Rostock, Germany); Philippe Giabbanelli (Miami University, USA)
- 44 [Evaluation of Large Scale RoI Mining Applications in Edge Computing Environments](#)
Loris Belcastro, Alberto Falcone and Alfredo Garro (University of Calabria, Italy); Fabrizio Marozzo (Dimes, Unical, Italy)

- 52 [An algorithm for threading assignment in large-scale wireless network mobile simulations](#)
Orestes G Manzanilla-Salazar (Ecole Polytechnique de Montreal, Canada); Hakim Mellah (GERAD and École Polytechnique de Montréal, Canada); Filippo Malandra (University at Buffalo, USA); Brunilde Sansò (Ecole Polytechnique de Montreal, Canada)

Session 3 : Modeling Pandemic Deasease and COVID-19

- 62 [A Novel Machine Learning-Assisted Policy Recommendation Method on COVID-19 Vaccination Campaign](#)
Bolin Song, Xiaoyu Wang and Peihan Li (Duke Kunshan\ Duke University, China); Peng Sun (Duke Kunshan University, China); Azzedine Boukerche (University of Ottawa, Canada)
- 70 [Extended Compartmental Models of Covid-19: a Cell-DEVS Definition](#)
Aidan A Fahlman, Cristina Ruiz Martín and Gabriel Wainer (Carleton University, Canada); Peter Dobias and Mark Rempel (Defence R&D Canada, Canada) Aidan A Fahlman, Cristina Ruiz Martín and Gabriel Wainer (Carleton University, Canada); Peter Dobias and Mark Rempel (Defence R&D Canada, Canada)
- 78 [A Distributed Simulation Approach to Integrate AnyLogic and Unity for Virtual Reality Applications: Case of COVID-19 Modelling and Training in a Dialysis Unit](#)
Jalal Possik (York University); Simon Gorecki (University of Bordeaux, France); Ali Asgary and Adriano O. Solis (York University, Canada); Greg Zacharewicz (IMT - Mines Ales & Lab LGI2P, France); Mohammadali Tofighi (York University, Canada); Mohammad Ali Shafiee, Asad Merchant and Mehdi Aarabi (Toronto General Hospital, Canada); Abel Guimaraes and Nazanin Nadri (York University, Canada)

Session 4 : Parallel Modeling & Simulations

- 85 [Federated Scheduling in Clustered Many-core Processors](#)
Ryotaro Koike and Takuya Azumi (Saitama University, Japan)
- 93 [Parallel Simulation of Stochastic Reward Nets using Theatre](#)
Franco Cicirelli (CNR - National Research Council, Italy); Libero Nigro (University of Calabria, DIMES, Italy)
- 101 [Contention-Free Scheduling Algorithm Using LET Paradigm for Clustered Many-core Processor](#)
Atsushi Yano, Shingo Igarashi and Takuya Azumi (Saitama University, Japan)

105 [Parallel Real-time Simulation on Commodity Hardware with Reusable Power System Models](#)

Raphael Eidenbenz (Hitachi ABB Power Grids Research, Switzerland); Carsten Franke (University of Applied Science Munich, Germany); Mats Larsson (Hitachi ABB Power Grids Research, Switzerland); Alexandru Moga (Hitachi ABB Power Grids, Switzerland); Thanikesavan Sivanthi (ABB Corporate Research Switzerland, Switzerland)

Session 5 : Modeling IoT systems, sensors & Agents

114 [An IoT based Smart Irrigation Management System using Reinforcement Learning modeled through a Markov Decision Process](#)

Luis Miguel Samaniego Campoverde (University of Calabria, Italy); Mauro Tropea (Università della Calabria, Italy); Floriano De Rango (University of Calabria, Italy)

118 [Lightweight Dynamic Topic-Centric End-to-End Security Mechanism for MQTT](#)

Mattia Giovanni Spina, Floriano De Rango and Gerardo Mario Marotta (University of Calabria, Italy)

125 [Performability Assessment and Sensitivity Analysis of a Home Automation System](#)

Carlos Victor (UFPI, Brazil); Tuan Anh Nguyen (Konkuk University, Korea (South)); Leonardo Augusto Silva (Universidade Federal do Piauí, Brazil); Ermeson Andrade (Federal Rural University of Pernambuco, Brazil); Guto Leoni (Federal University of Pernambuco, Brazil); Dugki Min and Jae Woo Lee (Konkuk University, Korea (South)); Francisco Airton Silva (Universidade Federal do Piauí, Brazil)

129 [Optimistic Parallel Simulation of Tightly Coupled Agents in Continuous Time](#)

Philipp Andelfinger and Adelinde Uhrmacher (University of Rostock, Germany)

138 [Reinforcing Traffic Safety by Using CAM to Verify Velocity Accuracy](#)

Erik de Britto e Silva (University of Antwerp & Imec - Fondazione Bruno Kessler, Belgium); Seilendria A. Hadiwardoyo (University of Antwerp & IMEC, Belgium); Cristina E. Costa (Fondazione Bruno Kessler, Italy); Johann M. Marquez-Barja (University of Antwerpen & imec, Belgium)

Session 6 : Real-time systems

146 [Determining Edge Node Real-Time Capabilities](#)

Alexander Willner (Technische Universität Berlin & Fraunhofer FOKUS, Germany); Varun Gowtham (TU Berlin, Fraunhofer FOKUS, Germany); Oliver Keil (Fraunhofer FOKUS, Germany); Simon Tschöke (GEC,

Germany); Aniket Yeole (Fraunhofer FOKUS, Germany); Florian Schreiner (Fraunhofer Institut FOKUS, Germany)

155 [Time-Sensitive Networking over Metropolitan Area Networks for Remote Industrial Control](#)

Alexander Willner (Technische Universität Berlin & Fraunhofer FOKUS, Germany); Simon Tschöke (GEC, Germany); Frederic Lynker and Hauke Buhr (Fraunhofer FOKUS, Germany); Axel Vick and Moritz Chemnitz (Fraunhofer IPK, Germany); Florian Schreiner (Fraunhofer Institut FOKUS, Germany)

159 [A study on real-time image processing applications with edge computing support for mobile devices](#)

Gabriele Proietti Mattia (Sapienza University of Rome, Italy); Roberto Beraldi (Sapienza Università di Roma, Italy)

166 [PM10 Data Assimilation on Real-time Agent-based Simulation using Machine Learning Models: case of Dakar Urban Air Pollution Study](#)

Bassirou Ngom (Université Cheikh Anta Diop, Senegal & Sorbonne Université & UMISCO, IRD, France); Moussa Diallo and Madoune Robert Seye (UCAD, Senegal); Mamadou Drame (UCAD/FST, Senegal); Nicolas Marilleau (Sorbonne Université & UMMISCO, IRD, France); Christophe Cambier (Sorbonne University, France)

170 [Real-Time Mission Planning Simulations from Geospatial Data](#)

Joshua J. G. Power (University of Victoria & University of New Brunswick, Canada); Derek Jacoby (University of Victoria & QVirt Labs, Canada); Matt Plaudis and Xi Sun (University of Victoria, Canada); Marc-Antoine Drouin (National Research Council Canada, Canada); Yvonne Coady (University of Victoria, Canada); Julian Meng (University of New Brunswick, Canada)

Session 7 : Modeling UAV Systems

172 [GTSS-UC: a Game Theoretic approach for Services' Selection in UAV Clouds](#)

Aboubakeur Elseddik Rezigat, Hadj Saad Benguettache and Fatima Zohra Bousbaa (University of Laghouat, Algeria); Nasreddine Lagraa (Amar Thelidji University, Laghouat & LIM Laboratory, Algeria); Chaker Abdelaziz Kerrache (University of Laghouat, Algeria); Abderrahmane Lakas (UAE University, United Arab Emirates); Abdou El Karim Tahari (University of Laghouat, Algeria)

180 [Evaluating the effectiveness of takeoff assignment strategies under irregular configurations](#)

Jamie Wubben (Universitat Politècnica de València, Spain); Jose Maria Cecilia (Universitat Politècnica de València, Spain); Carlos T. Calafate

(Universidad Politécnica de Valencia, Spain); Juan-Carlos Cano (Universidad Politecnica de Valencia, Spain); Pietro Manzoni (Universitat Politècnica de València, Spain)

- 187 [A FANET Simulator Designed and Implemented to Study Routing Algorithms](#)
Alessio Del Conte (University of Padua, Italy); Andrea Marin (Universita' Ca' Foscari Venezia, Italy); Claudio E. Palazzi (University of Padua, Italy)

Session 8 : Modeling and Simulations

- 194 [An Open-source Implementation of LSTM and GRU in the Ptolemy Simulation Framework](#)
Vasilis Daoulas, Nikolaos Tampouratzis, Panagiotis Mousoulitis and Ioannis Papaefstathiou (Aristotle University of Thessaloniki, Greece)
- 202 [MOESIL: A Cache Coherency Protocol for Locked Mixed Criticality L1 Data Cache](#)
Arun S Nair (Birla Institute of Technology and Science, Pilani - K. K. Birla Goa Campus, India & Nexteer Automotive India Software Center, India); Aboli Pai (Birla Institute of Technology and Science, Pilani - K K Birla Goa Campus, India); Geeta Patil (BMS Institute of Technology and Management, India); Biju K Raveendran (Birla Institute of Technology and Science, Pilani, India)
- 210 [Simulation of Hybrid Edge Computing Architectures](#)
Luca Serena (University of Bologna, Italy); Mirko Zichichi (Universidad Politécnica de Madrid & Law, Science and Technology, Italy); Gabriele D'Angelo (University of Bologna, Italy); Stefano Ferretti (University of Urbino, Italy)
- 218 [Creating Web-based, Meta-Simulation Environments for Social Dynamics in an Interactive Framework for Public Policy Analysis and Design](#)
Nikitas M Sgouros and Dimosthenis Kyriazis (University of Piraeus, Greece)
- 222 [SEP4CAM -- A Simulative / Emulative Platform for C-V2X Application Development in Cross-Border and Cross-Domain Environments](#)
Sebastian Peters (TU Berlin & DAI Labor, Germany); Fikret Sivrikaya (GT-ARC gGmbH & Technische Universität Berlin, Germany); Xuan-Thuy Dang (Technische Universität Berlin & DAI Labor, Germany)