

**2020 18th ACM-IEEE
International Conference on
Formal Methods and Models
for System Design
(MEMOCODE 2020)**

**Jaipur, India
2-4 December 2020**



**IEEE Catalog Number: CFP20MCD-POD
ISBN: 978-1-7281-9149-2**

**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:	CFP20MCD-POD
ISBN (Print-On-Demand):	978-1-7281-9149-2
ISBN (Online):	978-1-7281-9148-5

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

Hybrid Systems	
A Contrastive Plan Explanation Framework for Hybrid System Models	1
<i>Mir Md Sajid Sarwar, Rajarshi Ray and Ansuman Banerjee</i>	
Probabilistic Reachability for Uncertain Stochastic Hybrid Systems via Gaussian Processes	12
<i>Mariia Vasileva, Fedor Shmarov and Paolo Zuliani</i>	
REAFFIRM: Model-Based Repair of Hybrid Systems for Improving Resiliency	23
<i>Luan Nguyen, Gautam Mohan, James Weimer, Oleg Sokolsky, Insup Lee and Rajeev Alur</i>	
Verification	
Bayesian Statistical Model Checking for Continuous Stochastic Logic	35
<i>Ratan Lal, Weikang Duan and Pavithra Prabhakar</i>	
Robustness Contracts for Scalable Verification of Neural Network-Enabled Cyber-Physical Systems	46
<i>Nikhil Naik and Pierluigi Nuzzo</i>	
Formal Modeling and Verification of Rate Adaptive Pacemakers for Heart Failure	58
<i>Moon Soo Kim, Weiwei Ai, Partha Roop, Nathan Allen, Rohit Ramchandra and Julian Paton</i>	
Safe and Trustworthy Autonomy	
Runtime Verification of Timed Properties in Autonomous Robots	69
<i>Mohammed Foughali, Saddek Bensalem, Jacques Combaz and Félix Ingrand</i>	
CROME: Contract-Based Robotic Mission Specification	81
<i>Piergiuseppe Mallozzi, Pierluigi Nuzzo, Patrizio Pelliccione and Gerardo Schneider</i>	
Specification-guided Software Fault Localization for Autonomous Mobile Systems	92
<i>Tomoya Yamaguchi, Bardh Hoxha, Jyotirmoy V. Deshmukh and Danil Prokhorov</i>	
Scheduling, Routing, and Security	
Real-time Scheduling of I/O Transfers for Massively Parallel Processor Arrays	104
<i>Dominik Walter, Michael Witterauf and Jürgen Teich</i>	
Lightweight Formal Method for Robust Routing in Track-based Traffic Control Systems . .	115
<i>Maryam Bagheri, Edward A. Lee, Eunsuk Kang, Marjan Sirjani, Ehsan Khamespanah and Ali Movaghar</i>	
Security Types for Synchronous Data Flow Systems	125
<i>Sanjiva Prasad, Rathnakar Madhukar Yerraguntla and Subodh Sharma</i>	
Short Papers	

Efficient reachability analysis of parametric linear hybrid systems with time-triggered transitions	137
<i>Marcelo Forets, Daniel Freire Caporale and Christian Schilling</i>	
Dependence Analysis and Automated Partitioning for Scalable Formal Analysis of SystemC Designs.....	143
<i>Paula Herber and Timm Liebrenz</i>	
Verifying Absence of Hardware-Software Data Races using Counting Abstraction	149
<i>Tuba Yavuz</i>	
Safe and efficient collision avoidance control for autonomous vehicles	155
<i>Qiang Wang, Dachuan Li and Joseph Sifakis</i>	
Cephalopode: A custom processor aimed at functional language execution for IoT devices.	161
<i>Jeremy Pope, Jules Saget and Carl-Johan Seger</i>	
Stately: An FSM Design Tool	167
<i>Jeremy Pope, Jules Saget and Carl-Johan Seger</i>	