# **2022 20th ACM-IEEE International Conference on Formal Methods and Models for System Design (MEMOCODE 2022)**

Shanghai, China **13 – 14 October 2022** 



IEEE Catalog Number: CFP22MCD-POD **ISBN:** 

979-8-3503-3191-2

#### **Copyright © 2022 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:	CFP22MCD-POD
ISBN (Print-On-Demand):	979-8-3503-3191-2
ISBN (Online):	979-8-3503-3190-5
ISSN:	1936-9492

#### 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



## TABLE OF CONTENTS

A Novel Approach to Real-Time Contract Based Reasoning for Hybrid Systems Surinder Sood, Avinash Malik, Partha Roop	1
Deriving Pipeline Models for Timing Analysis from High-Level HDL Processor Designs 1 Samira Ait Bensaid, Mihail Asavoae, Farhat Thabet, Mathieu Jan	12
A Reinforcement-Learning Style Algorithm for Black Box Automata	23
Mechanization of a Large DSML: An Experiment with AADL and Coq	34
Runtime Interchange of Enforcers for Adaptive Attacks: A Security Analysis Framework for Drones	13
Alex Baird, Hammond Pearce, Srinivas Pinisetty, Partha Roop	
ORIGAMI: Folding Data Structures to Reduce Timing Side-Channel Leakage	54
Real-Time Scheduling of Machine Learning Operations on Heterogeneous Neuromorphic SoC 6 Anup Das	56
Creating a Language for Writing Real-Time Applications for the Internet of Things	78
Robust Hardware-Software Co-Simulation Framework for Design and Validation of Hybrid Systems	€
Surinder Sood, Avinash Malik, Partha Roop	
Runtime Verification for Clinically Interpretable Arrhythmia Classification	)9
Reach-Avoid Verification for Time-Varying Systems with Uncertain Disturbances	9
Towards Efficient Input Space Exploration for Falsification of Input Signal Class Augmented STL	31
A Small, but Important, Concurrency Problem in Verilog's Semantics? (Work in Progress) 14 Andreas Lööw	12
Lifecycle-Based View on Cyber-Physical System Models Using Extended Hidden Markov Models	18

#### Author Index