

2025 IEEE/ACM 13th International Conference on Formal Methods in Software Engineering (FormaliSE 2025)

**Ottawa, Ontario, Canada
27-28 April 2025**



**IEEE Catalog Number: CFP25ZAP-POD
ISBN: 979-8-3315-0176-1**

**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:	CFP25ZAP-POD
ISBN (Print-On-Demand):	979-8-3315-0176-1
ISBN (Online):	979-8-3315-3794-4
ISSN:	2380-873X

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 IEEE/ACM 13th International Conference on Formal Methods in Software Engineering (FormaliSE) **FormaliSE 2025**

Table of Contents

Foreword	viii
Committees	x

Session 1 - Formal Methods and Autonomous Systems

CPS Falsification using Autoencoded Input Models	1
<i>Youssef Zahar (University of Minnesota, USA) and Sanjai Rayadurgam (University of Minnesota, USA)</i>	
Modeling Language for Scenario Development of Autonomous Driving Systems	11
<i>Toshiaki Aoki (JAIST), Takashi Tomita (JAIST), Tatsuji Kawai (Kochi University), Daisuke Kawakami (Mitsubishi Electric Corporation), and Nobuo Chida (Mitsubishi Electric Corporation)</i>	
Robustness Verification of Video Classification Neural Networks	22
<i>Samuel Sasaki (Vanderbilt University), Diego Manzananas Lopez (Vanderbilt University), Preston K. Robinette (Vanderbilt University), and Taylor T. Johnson (Vanderbilt University)</i>	

Session 2 – Theorem Proving and Probabilistic Model Checking

The Burden of Proof: Automated Tooling for Rapid Iteration on Large Mechanised Proofs	34
<i>Chengsong Tan (Imperial College London, United Kingdom; Kaihong, China), Alastair Donaldson (Imperial College London, United Kingdom), Jonathan Julian Huerta y Munive (Czech Technical University, Czech Republic), and John Wickerson (Imperial College London, United Kingdom)</i>	

A proof-based ground algebraic meta-model for reasoning on ASTD in Event-B	46
<i>Christophe Chen (IRIT/Toulouse INP-ENSEEIH, CNRS, University of Toulouse, France and Université de Sherbrooke, Canada), Peter Rivière (IRIT/Toulouse INP-ENSEEIH, CNRS, University of Toulouse, France and JAIST - Japan Advanced Institute of Science and Technology, Nomi, Ishikawa, Japan), Neeraj Kumar Singh (IRIT/Toulouse INP-ENSEEIH, CNRS, University of Toulouse, France), Guillaume Dupont (IRIT/Toulouse INP-ENSEEIH, CNRS, University of Toulouse, France), Yamine Aït-Ameur (IRIT/Toulouse INP-ENSEEIH, CNRS, University of Toulouse, France), and Marc Frappier (University of Sherbrooke, Canada)</i>	
Probabilistic Model Checking of Disaster Resource Distribution Strategies	58
<i>Kenneth Johnson (Auckland University of Technology, New Zealand) and Meena Kumari (Auckland University of Technology, New Zealand)</i>	

Session 3 - Temporal Logic and Contracts

Specifying Distributed Hash Tables with Allen Temporal Logic	63
<i>Nuno Policarpo (Instituto Superior Técnico, University of Lisbon), José Frago Santos (INESC-ID/University of Lisbon), Alcino Cunha (University of Minho & INESC TEC), João Leitão (NOVA-LINCS & NOVA School of Science and Technology), and Pedro Akos Costa (NOVA-LINCS & NOVA School of Science and Technology)</i>	
Temporal Logics Meet Real-World Software Requirements: A Reality Check	74
<i>Roman Bögli (University of Bern), Atefeh Rohani (University of Bern), Thomas Studer (University of Bern), Christos Tsiganos (University of Athens), and Timo Kehrer (University of Bern)</i>	
Detecting Redundant Preconditions	86
<i>Nicola Thoben (Carl von Ossietzky Universität Oldenburg) and Heike Wehrheim (Carl von Ossietzky Universität Oldenburg)</i>	

Session 4 – Generative AI and Fuzzy Logic

LLM-based Generation of Weakest Preconditions and Precise Array Invariants	96
<i>Daragh King (Trinity College Dublin), Vasileios Koutavas (Trinity College Dublin), and Laura Kovacs (TU Wien)</i>	
VeCoGen: Automating Generation of Formally Verified C Code with Large Language Models	101
<i>Merlijn Sevenhuijsen (Scania & KTH Royal Institute of Technology, Sweden), Khashayar Ettemadi (KTH Royal Institute of Technology, Sweden), and Mattias Nyberg (Scania & KTH Royal Institute of Technology, Sweden)</i>	
Embracing Uncertainty: A Fuzzy Theoretical Model for Goal Fulfillment Assessment	113
<i>Vincenzo Grassi (University of Roma Tor Vergata, Italy), Raffaella Mirandola (Karlsruhe Institute of Technology, Germany), and Diego Perez-Palacin (Linnaeus University, Sweden)</i>	

Session 5 - Formal Specification and Verification

Refining Alloy-Based Mutation Operators to Reflect Common Mistakes	124
<i>Ana Jovanovic (The University of Texas at Arlington), Mohammad Nurullah Patwary (University of Texas at Arlington), and Allison Sullivan (University of Texas at Arlington)</i>	
Verifying Multiple TLA+ Configurations with Blast	135
<i>Paul Somson (INESC TEC) and Alcino Cunha (INESC TEC & Universidade do Minho)</i>	
Typestates Specification and Verification in Frama-C	146
<i>PATTE Sébastien (CEA-List) and PREVOSTO Virgile (CEA-List)</i>	
Author Index	157