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Soggetti	Software engineering Computer engineering Computer networks Computer science Artificial intelligence Computer simulation Software Engineering Computer Engineering and Networks Theory of Computation Artificial Intelligence Computer Modelling
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Nota di contenuto	Learning and Formal Synthesis -- From Passive to Active: Learning Timed Automata Efficiently -- Generating Correct-by-Construction Distributed Implementations from Formal Maude Designs -- Parameter Synthesis and Robustness Analysis of Rule-Based Models -- Formal Methods for DNNs -- PaRoT: A Practical Framework for Robust Deep Neural Network Training -- Simplifying Neural Networks using Formal Verification -- High Assurance Systems -- Neural Simplex Architecture -- Strengthening Deterministic Policies for POMDPs -- Benchmarking Software Model Checkers on Automotive Code -- Requirement Specification and Testing -- Automated Requirements-Based Testing of Black-Box Reactive Systems -- Formal Verification of Parallel Prefix

Sum -- Specification Quality Metrics Based on Mutation and Inductive Incremental Model Checking -- Validation and Solvers -- A Validation Methodology for OCaml-to-PVS Translation -- On the Usefulness of Clause Strengthening in Parallel SAT Solving -- Solvers and Program Analysis -- Verifying a Solver for Linear Mixed Integer Arithmetic in Isabelle/HOL\* -- Constraint Caching Revisited -- Per-Location Simulation -- Verification and Timed Systems -- Sampling Distributed Schedules for Resilient Space Communication -- Model Checking Timed Hyperproperties in Discrete-Time Systems -- Verifying Band Convergence for Sampled Control Systems -- Autonomy and Other Applications -- Heterogeneous Verification of an Autonomous Curiosity Rover -- Run-Time Assurance for Learning-Enabled Systems -- hpnmg: A CC++ Tool for Model Checking Hybrid Petri Nets with General Transitions -- Hybrid and Cyber-Physical Systems -- A Transformation of Hybrid Petri Nets with Stochastic Firings into a Subclass of Stochastic Hybrid Automata -- Constraining Counterexamples in Hybrid System Falsification: Penalty-Based Approaches -- Falsification of Cyber-Physical Systems with Constrained Signal Spaces.

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### Sommario/riassunto

This book constitutes the proceedings of the 12th International Symposium on NASA Formal Methods, NFM 2020, held in Moffett Field, CA, USA, in May 2020.\* The 20 full and 5 short papers presented in this volume were carefully reviewed and selected from 62 submissions. The papers are organized in the following topical sections: learning and formal synthesis; formal methods for DNNs; high assurance systems; requirement specification and testing; validation and solvers; solvers and program analysis; verification and times systems; autonomy and other applications; and hybrid and cyber-physical systems. \*The conference was held virtually due to the COVID-19 pandemic. The chapter “Verifying a Solver for Linear Mixed Integer Arithmetic in Isabelle/HOL” is available open access under a Creative Commons Attribution 4.0 International License via [link.springer.com](https://link.springer.com).

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