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UNIVERSITÄT ZU LÜBECK

FM 2023 LÜBECK

FM 2023 Program

March 6th - 10th 2023 in Lübeck, Germany

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Monday, March 6th

09:00-10:30	**DOCTORAL SYMPOSIUM** Room: AM2 **Invited Inspiration Talk:** **Paula Herber** **Julius Adelt: Reusable Contracts for Deductive Verification of Autonomous Hybrid Systems**	**T1 Paolo Arcaini** **Hybrid System Falsification Tutorial** Room: AM S3 Chair: **Martin Sachenbacher**	**T2 Daniel Neider** **Verification of Deep Neural Networks** Room: AM3 Chair: **Hannes Kallwies**	**T4 Adrián Rebola-Pardo** **Reasoning with Quantified Boolean Formulas** Room: AM S1 Chair: **Cesar Sanchez**	**WORKSHOP** **Application of formal methods and digital twins** Room: AM S2 **Session 1:** Session Chair: **Stefan Hallerstede** **Welcome** **Keynote** **Ana Cavalcanti - RoboStar Twins?**	**WORKSHOP** **FMTea 2023** Room: AM4 **Welcome from the chairs** **Keynote:** **Erika Ábrahám -** **Automated Exercise Generation for Satisfiability Checking**
10:30-11:00	Coffee Break					
11:00-12:30	Thomas Flinkow: Modular Neural Network Verification Marco Sälzer: Fundamental Limits of Formal Verification of Deep Neural Networks Bas van den Heuvel: Session Types for Correct Communicating Software Systems Anna Fritz: Negotiating Remote Attestation Protocols Dara MacConville: A Robotics Focused Verification Tool for Python	**T1 Paolo Arcaini** **Hybrid System Falsification Tutorial** Room: AM S3 Chair: **Martin Sachenbacher**	**T2 Daniel Neider** **Verification of Deep Neural Networks** Room: AM3 Chair: **Hannes Kallwies**	**T4 Adrián Rebola-Pardo** **Reasoning with Quantified Boolean Formulas** Room: AM S1 Chair: **Cesar Sanchez**	Sylvain Hallé, Chukri Soueidi and Yliès Falcone: **Leveraging Runtime Verification for the Monitoring of Digital Twins** Eduard Kamburjan, Vidar Klungre, Silvia Lizeth Tapia Tarifa, Rudolf Schlatte, Martin Giese, David Cameron and Einar Broch Johnsen: **Emerging Challenges in Compositionality and Correctness for Digital Twins** Jonas Schiffl and Alexander Weigl: **Are Formal Contracts a useful Digital Twin of Software Systems?**	Thierry Lecomte: **Teaching and Training in Formalisation with B** Nicolas Féral and Alain Giorgetti: **A Gentle Introduction to Verification of Parameterized Reactive Systems** Géraldine Brieven, Liénardy Simon, Lev Malcev and Benoit Donnet: **Graphical Loop Invariant Based Programming.**
12:30-14:00	Lunch					
14:00-15:30	Andoni Rodriguez: Quantifier-elimination methods for faster reactive synthesis modulo theories Daniel Jurjo: Defining abstract domains using rewriting rules Benjamin Bisping: Analyzing Equivalences in Concurrent Models Muhammad Rizwan Ali: Cost Analysis for a Resource Sensitive Workflow Modelling Language		**T3 Nathanaël Fijalkow** **Machine Learning Guided Program Synthesis** Room: AM3 Chair: **Aliyu Ali**	**T4 Adrián Rebola-Pardo** **Reasoning with Quantified Boolean Formulas** Room: AM S1 Chair: **Cesar Sanchez**	Martin Leucker, Martin Sachenbacher and Lars Bernd Vosteen: **Digital Twin for Rescue Missions – a Case Study** Daniel Thoma, Martin Sachenbacher, Martin Leucker and Aliyu Tanko Ali: **A Digital Twin for Coupling Mobility and Energy Optimization: The ReNuBiL Living Lab** Andrea Pferscher, Benjamin Wunderling, Bernhard K. Aichernig and Edi Muskardin: **Mining Digital Twins of a VPN Server**	Felix Freiberger: **Model Checking Concurrent Programs for Autograding in pseuCo Book** Somsak Vanit-Anunchai: **Teaching low-code Formal Methods with Coloured Petri Nets** Markus Alexander Kuppe: **Teaching TLA+ to Engineers at Microsoft**
15:30-16:00	Coffee Break					
16:00-17:30	Stefan Marksteiner: Learning-Based Model-Driven Cybersecurity Test Case Generation Lex Bailey: Checking Confidentiality in Isabelle/UTP Surasak Phetmanee: Towards Verifying Stackelberg Security Games Jonas Schiffl: An Abstract Representation for Designing and Verifying Smart Contracts Carolina Gerlach: Probabilistic Hyperproperties		**T3 Nathanaël Fijalkow** **Machine Learning Guided Program Synthesis** Room: AM3 Chair: **Aliyu Ali**	**T4 Adrián Rebola-Pardo** **Reasoning with Quantified Boolean Formulas** Room: AM S1 Chair: **Cesar Sanchez**	**Session 4:** Session Chair: **Eduard Kamburjan** **Digital Twin Workshop Discussion**	**Special session: Formal Methods in the ACM curriculum**
	Welcome Reception (City Hall of Lübeck)					

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Tuesday, March 7th

* Nominated for Best Paper Award

08:45-09:00	**Opening Session**
09:00-10:00	**Session 0** Session Chair: **Joost-Pieter Katoen**
	Keynote Talk Room: AM1 Laura Kovacs - **Symbolic Computation in Automated Program Reasoning**
10:00-10:30	Ana Cavalcanti - **Lucas Award**
10:30-11:00	**Coffee Break**
11:00-12:30	Session: **SAT/SMT** Session Chair: **Martin Sachenbacher**
	Sylvie Boldo, Francois Clement, Vincent Martin, Micaela Mayero and Houda Mouhcine **A Coq formalization of Lebesgue Induction Principle and Tonelli's Theorem**
	Tomáš Kolárik and Stefan Ratschan **Railway Scheduling Using Boolean Satisfiability Modulo Simulations**
	Matan Peled, Bat-Chen Rothenberg and Shachar Itzhaky **SMT Sampling via Model-Guided Approximation ***
	Yu Liu, Pavle Subotic, Emmanuel Letier, Sergey Mechtaev and Abhik Roychoudhury. **Efficient SMT-based Network Fault Tolerance Verification**
12:30-14:00	**Lunch | FME Business Meeting - Room: AM S2**
14:00-15:30	Session: **Verification 1** Session Chair: **Sandrine Blazy**
	Robert Sison, Scott Buckley, Toby Murray, Gerwin Klein and Gernot Heiser **Formalising the Prevention of Microarchitectural Timing Channels by Operating Systems**
	Maurice H. ter Beek, Guillermina Cledou, Rolf Hennicker and José Proença **Can we Communicate? Using Dynamic Logic to Verify Team Automata**
	Gianluca Amato and Francesca Scozzari **The ScalaFix equation solver**
	Huanhuan Sheng, Alexander Bentkamp and Bohua Zhan **HHLPy: Practical Verification of Hybrid Systems using Hoare Logic**
15:30-16:00	**Coffee Break**
16:00-17:20	Session: **Quantitative Verification** Session Chair: **Matthias Volk**
	Fabian Bauer-Marquart, Stefan Leue and Christian Schilling **symQV: Automated Symbolic Verification of Quantum Programs**
	Stefano M. Nicoletti, Milan Lopuhaä-Zwakenberg, E. Moritz Hahn and Mariëlle Stoelinga **PFL: a Probabilistic Logic for Fault Trees**
	Sven Dziadek, Uli Fahrenberg and Philipp Schlehuber-Caissier **Energy Problems in Finite and Timed Automata with Büchi Conditions ***
	Rubén Rubio, Narciso Marti-Oliet, Isabel Pita and Alberto Verdejo **QMaude: quantitative specification and verification in rewriting logic**

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Wednesday, March 8th

* Nominated for Best Paper Award

09:00-10:00	**Session 0** Session Chair: **Martin Leucker**	
	Keynote Talk Room: AM1 Harald Rueß - **The next big thing: from embedded systems to embodied actors**	
10:00-10:20	**Journal First Track** Room: AM1 Angelo Ferrando, Rafael C. Cardoso, Marie Farrell, Matt Luckcuck, Fabio Papacchini, Michael Fisher and Viviana Mascardi **Bridging the gap between single- and multi-model predictive runtime verification**	
10:20-10:30	Sebastian Jester: **Research Program Funding - Cybersecurity**	
10:30-11:00	**Coffee Break & Exhibition in Foyer**	
11:00-12:30	**MAIN SYMPOSIUM** Room: AM1	**INDUSTRY DAY** Room: AM4
	Session: **Concurrency and Memory Models** Session Chair: **Marieke Huisman**	Session: **Industry Day 1** Session Chair: **Chih-Hong-Cheng**
	Vincenzo Ciancia , Jan Friso Groote, Diego Latella, Mieke Massink and Erik De Vink **Minimisation of Spatial Models using Branching Bisimilarity**	Franck Cassez , Joanne Fuller, Milad K. Ghale, David Pearce and Horacio Mijail Anton Quiles **Formal and Executable Semantics of the Ethereum Virtual Machine in Dafny**
	Heike Wehrheim, Lara Bargmann and Brijesh Dongol **Reasoning about Promises in Weak Memory Models with Event Structures**	Ben Liblit, Linghui Luo, Alejandro Molina, Rajdeep Mukherjee, Zachary Patterson, Goran Piskachev, Martin Schäf, Omer Tripp and Willem Visser **Shifting Left for Early Detection of Machine-Learning Bugs**
	Robert Colvin **A fine-grained semantics for arrays and pointers under weak memory models**	Masoud Ebrahimi, Stefan Marksteiner, Dejan Nickovic, Roderick Bloem, David Schögler, Philipp Eisner, Samuel Sprung, Thomas Schober, Sebastian Chlup, Christoph Schmittner and Sandra König **A Systematic Approach to Automotive Security**
	Petra van den Bos and Sung-Shik Jongmans **VeyMont: Parallelising Verified Programs instead of Verifying Parallel Programs**	Adam Molin, Edgar Aguilar, Dejan Nickovic, Mengjia Zhu, Alberto Bemporad and Hasan Esen **Specification-Guided Critical Scenario Identification for Automated Driving**
12:30-14:00	**Lunch & Exhibition in Foyer**	
14:00-15:40	Session: **Verification 2** Session Chair: **Volker Stolz**	Session: **Industry Day 2** Session Chair: **Thomas Santen**
	Marco Paganoni and Carlo A. Furia **Verifying At the Level of Java Bytecode**	Vahid Hashemi, Jan Kretinsky, Sabine Rieder and Jessica Schmidt **Runtime Monitoring for Out-of-Distribution Detection in Object Detection Neural Networks**
	Jan Oliver Ringert and Allison K. Sullivan **Abstract Alloy Instances**	Akshay Dhonthi, Ernst Moritz Hahn and Vahid Hashemi **Backdoor Mitigation in Deep Neural Networks via Strategic Retraining**

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14:00-15:40	David Basin, Daniel Stefan Dietiker, Srdjan Krstic, Yvonne-Anne Pignolet, Martin Raszyk, Joshua Schneider and Arshavir Ter-Gabrielyan **Monitoring the Internet Computer**	Guy Amir, Ziv Freund, Guy Katz, Elad Mandelbaum and Idan Refaeli **veriFIRE: Verifying an Industrial, Learning-Based Wildfire Detection System**
	František Blahoudek, Yu-Fang Chen, David Chocholatý, Vojtěch Havlena, Lukáš Holík, Ondrej Lengal and Juraj Síč **Word Equations in Synergy with Regular Constraints ***	Jan Lukas Deichmann **Verification of distributed medical device communication (IEEE 11073 SDC)**
	Journal First Track Hichem Debbi **A Debugging Game for Probabilistic Models**	Falak Sher, Matthias Volk, Marielle Stoelinga and Joost-Pieter Katoen **The Fault Tree Analyser SAFEST**
Excursion & Conference Dinner		

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Thursday, March 9th

* Nominated for Best Paper Award

Room: AM1

09:00-10:00	**Session 0** Session Chair: **Joost-Pieter Katoen** **Keynote Talk** Room: AM1 Nils Jansen **Intelligent and Dependable Decision-Making Under Uncertainty**
10:00-10:20	**Journal First Track** Room: AM1 Nicholas Coughlin and Graeme Smith **Compositional noninterference on hardware weak memory models**
10:30-11:00	**Coffee Break**
11:00-12:30	Session: **Formal Methods in AI** Session Chair: **Özgür L. Özcep** Achim D. Brucker and Amy Stell **Verifying Feedforward Neural Networks for Classification in Isabelle/HOL** Nicolas Amat and Silvano Dal Zilio **SMPT: A Testbed for Reachabilty Methods in Generalized Petri Nets** Taylor Dohmen, Stanley Bak, Ashutosh Trivedi, Alvaro Velasquez, Piotr Wojciechowski and K. Subramani **The Octatope Abstract Domain for Verification of Neural Networks** Fortunat Rajaona, Ioana Boureanu, Vadim Malvone and Francesco Belardinelli **Program Semantics and Verification Technique for AI-centred Programs ***
12:30-14:00	**Lunch**
14:00-15:00	**Luminary Talk -** Jeanette Wing **Trustworthy AI** Session Chair: **Marsha Chechik**
15:00-15:30	**Journal First Track -** Mario Gleirscher, Radu Calinescu, James Douthwaite, Benjamin Lesage, Colin Paterson, Jonathan Aitken, Rob Alexander and James Law **Verified Synthesis of Optimal Safety Controllers for Human-Robot Collaboration** Session Chair: **Marsha Chechik**
15:30-16:00	**Coffee Break**
16:00-17:30	Session: **Safety and Reliability** Session Chair: **Jan O. Ringert** Montserrat Hermo, Paqui Lucio and Cesar Sanchez **Tableaux for Realizability of Safety Specfications** Sebastiaan Brand, Thomas Bäck and Alfons Laarman **A Decision Diagram Operation for Reachability *** Tsutomu Kobayashi, Martin Bondu and Fuyuki Ishikawa **Formal Modelling of Safety Architecture for Responsibility-Aware Autonomous Vehicle via Event-B Refinement** Davide Basile and Maurice H. ter Beek **A Runtime Environment for Contract Automata**
17:30-18:00	**Closing Session - Announcement of FM24** - Session Chair: **Martin Leucker**

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Friday, March 10th

09:00-10:30	**WORKSHOP - Overture** Room: AM S2 Organizers: Hugo Daniel Macedo, Ken Pierce
	Session 1 Session Chair: **Hugo Daniel Macedo**
	Welcome from the chairs
	International System of Quantities library in VDM **(Leo Freitas)**
	Implementation-First Approach of Developing Formal Semantics of a Simulat ion Language in VDM-SL **(Tomohiro Oda, Gael Dur, Stephane Ducasse and Hugo Macedo)**
10:30-11:00	Coffee Break
11:00-12:30	**Session 2** Session Chair: **Ken Pierce**
	Specification-based CSV support in VDM **(Leo Freitas and Aaron John Buhagiar)**
	VDM recursive functions in Isabelle/HOL **Leo Freitas and Peter Gorm Larsen**
	Topologically sorting VDM-SL definitions for Isabelle/HOL translation **Leo Freitas and Nick Battle**
12:30-14:00	Lunch
14:00-15:30	**Session 3** Session Chair: **Nick Battle**
	Bidirectional UML Visualisation of VDM Models **(Jonas Lund, Lucas Bjarke Jensen, Peter Gorm Larsen and Hugo Daniel Macedo)**
	Modelling Chess in VDM++ **(Morten Haahr Kristensen and Peter Gorm Larsen)**
	Modelling Maritime SAR Sweep Widths for Helicopters in VDM **(Alexander Sulaiman and Ken Pierce)**
	Community status and open table discussion
	End of the Event

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