

	Programming: What is Next? PROGRAM DEVELOPMENT I ROOM A	Verification and Validation of Concurrent and Distributed Systems I ROOM B	Industrial Day ROOM C
09:00-10:30	Programming - What is Next? Klaus Havelund, Bernhard Steffen	Step-wise Development of Provably Correct Actor Systems Bernhard Aichernig, Benedikt Maderbacher	Invited Talk Challenges and Opportunities of the Digital Transformation – a view from the Industrial Application Harald Ludanek
	Introducing Dynamical Systems and Chaos Early in Computer Science and Software Engineering Education can Help Advance Theory and Practice of Software Development and Computing David Harel, Assaf Marron	Violation Witnesses and Result Validation for Multi-Threaded Programs Dirk Beyer, Karlheinz Friedberger	Agile Business Engineering: From Transformation Towards Continuous Innovation Barbara Steffen, Falk Howar, Tim Tegeler, Bernhard Steffen
	Low-Code is Often High-Code, So We Must Design Low-Code Platforms to Enable Proper Software Engineering Timothy Lethbridge	Deploying TESTAR to enable remote testing in an industrial CI pipeline: a case-based evaluation Tanja Vos, Ismael Torres Boigues, Ernesto Calas Blasco, Hector Martinez Martinez, Pekka Aho, Fernando Pastor Ricos	
10:30-11:00	COFFEE BREAK		
11:00-12:30	Programming: What is Next? PROGRAM DEVELOPMENT II ROOM A	Verification and Validation of Concurrent and Distributed Systems II ROOM B	Industrial Day ROOM C
	Integrated Modeling and Development of Component-Based Embedded Software in Scala Klaus Havelund, Robert Bocchino	Formal Verification of an Industrial Distributed Algorithm: an Experience Report Nikolai Kosmatov, Delphine Longuet, Romain Soulat	Towards Living Canvases Barbara Steffen, Stephen Ryan, Frederik Möller Alex Rotgang, Tiziana Margaria
	Slang: The Sireum Programming Language Robby, John Hatcliff	A Formal Model of the Kubernetes Container Framework Gianluca Turin, Andrea Borgarelli, Simone Donetti, Einar Broch Johnsen, Silvia Lizeth Tapia Tarifa, Ferruccio Damiani	Mining Data Quality Rules for Data Migrations: A Case Study on Material Master Data Marcel Altendeitering
	HAMR: An AADL Multi-Platform Code Generation Toolset John Hatcliff, Jason Belt, Robby, Todd Carpenter	Tendermint Blockchain Synchronization: Formal Specification and Model Checking Sean Braithwaite, Ethan Buchman, Igor Konnov, Zarko Milosevic, Ilina Stoilkovska, Josef Widder, Anca Zamfir	DSLs and Middleware Platforms in a Model-Driven Development Approach for Secure Predictive Maintenance Systems in Smart Factories Jobish John, Tiziana Margaria, Dirk Pesch, Amrita Ghosal
12:30-14:30	LUNCH		

	Programming: What is Next? PROGRAM LANGUAGE CONCEPTS ROOM A	Verification and Validation of Concurrent and Distributed Systems III ROOM B	Industrial Day ROOM C
14:30-16:00	Fundamental Constructs in Programming Languages Peter Mosses	Modular Verification of Liveness Properties of the I/O Behavior of Imperative Programs Bart Jacobs	Use Cases for Simulation in the Development of Automated Driving Systems Hardi Hungar
	Time for All Programs, Not Just Real-Time Programs Edward Lee, Marten Lohstroh	Safe Sessions of Channel Actions in Clojure: A Tour of the Discourje Project Ruben Hamers, Sung-Shik Jongmans	Simulation-based Elicitation of Accuracy Requirements for the Environmental Perception of Autonomous Vehicles Robin Philipp, Hedan Qian, , Lukas Hartjen, Fabian Schuldt, Falk Howar
		Plenary Discussion on Verification And Validation Of Concurrent And Distributed Systems	From Requirements to Executable Rules: An Ensemble of Domain- Specific Languages for Programming Cyber-Physical Systems in Warehouse Logistics Malte Mauritz, Moritz Roidl
16:00-16:30	COFFEE BREAK		
	Programming: What is Next? GATE ROOM A	Automating Software Re-Engineering ROOM B	From Verification to Explanation ROOM C
16:30-18:00	Gradual Effect Types Philip Wadler	Automating Software Re-Engineering (Introduction to the ISO/IEC 2020 Track) Serge Demeyer, Reiner Hähnle, Heiko Mantel	From Verification to Explanation (Track Introduction) Christel Baier, Holger Hermanns
	Fixing Classification: A Viewpoint-based Approach Bran Selic, Alfonso Pierantonio	Formal Verification of Developer Tests: a Research Agenda Inspired by Mutation Testing Serge Demeyer, Brent Van Bladel, Mehrdad Abdi, Ali Parsai, Sten Vercammen	An Algorithm to Compute a Strict Partial Ordering of Actions in ActionTraces Martin Kölbl, Stefan Trace Leue
	The Future of Programming and Modelling: a Vision Perdita Stevens	Thirty-seven years of relational Hoare logic: remarks on its principles and history David Naumann	Vis: Towards Visualization for Deep Statistical Model Checking Timo P. Gros, David Groß, Stefan Gumhold, Jörg Hoffmann, Michaela Klauack, Marcel Steinmetz
18:30-19:30	ISO/IEC WELCOME RECEPTION		

	Programming: What is Next? DOMAIN-SPECIFIC LANGUAGES ROOM A	Automating Software Re-Engineering ROOM B	Software Verification Tools ROOM C
09:00-10:30	Towards Model-based Intent-Driven Adaptive Software Gabor Karsai, Daniel Balasubramanian, Alessandro Coglio, Abhishek Dubey	Finding Idioms in Source Code using Subtree Counting Techniques Dmitry Orlov	Software Verification Tools (Track Introduction) Markus Schordan, Dirk Beyer, Irena Bojanova
	The Interoperability Challenge: Building a model driven Digital Thread platform for CPS Tiziana Margaria, Hafiz Ahmad Awais Chaudhary, Ivan Guevara, Stephen Ryan, Alexander Schieweck	Parametric Timed Bisimulation Malte Lochau, Lars Luthmann, Hendrik Göttmann, Isabelle Bacher	Benchmarking Open-Source Static Analyzers for Security Testing for C Rohan Krishnamurthy, Christoph Gentsch, Thomas Heinze
		A Unifying Framework for Dynamic Monitoring and a Taxonomy of Optimizations Heiko Mantel, Jakobs	Verification of Liveness and Safety in BP using BPjs Michael Bar-Sinai, Gera Weiss
10:30-11:00 COFFEE BREAK			
	Programming: What is Next? ROOM A	Automating Software Re-Engineering ROOM B	Software Verification Tools ROOM C
11:00-12:30	Programming vs. That Thing Subject Matter Experts Do Markus Voelter	Modular Regression Verification for Reactive Systems Alexander Weigl, Mattias Ulbrich, Daniel Lentzsch	On Correctness, Precision, and Performance in Quantitative Verification Arnd Hartmanns, Klauck, Michaela Křetinský, David Jan Parker, Tim Quatmann, Andrea Turrini, Zhen Zhang, CarlosE Budde
	Aligned, Purpose - Driven Cooperation: The Future Way of System Development Tim Tegeler, Jonas Schürmann, Alexander Bainsczyk, Bernhard Steffen, Philip Zweihoff	Safer Parallelization Reiner Hähnle, Asmae Heydari Tabar, Arya Mazaheri, Mohammad Norouzi, Dominic Steinhöfel, Felix Wolf	Every Component Matters: Generating Parallel Verification Benchmarkswith Hardness Guarantees Marc Jasper, Maximilian Schlüter, David Schmidt, Bernhard Steffen
		Refactoring and Active Object Languages Volker Stolz, Violet Ka I Pun, Rohit Gheyi	
			sVerify: Verifying Smart Contracts through Lazy Annotation and Learning Bo Gao, Ling Shi, Jiaying Li, Jialiang Chang, Jun Sun, Zijiang Yang
12:30-14:30 LUNCH			
14:30-22:00 EXCURSION & ISO LA DINNER			

	Rigorous Engineering of Collective Adaptive Systems COORDINATION AND COMPOSITION ROOM A	Engineering of Digital Twins for Cyber-Physical Systems ROOM B	Rigorous Examination of Reactive Systems (RERS) ROOM C
09:00-10:30	Composition of Component Models - a Key to Construct Big Systems Wolfgang Reisig	Understanding DTs for CPSs: A Conceptual Model Tao Yue, Shaukat Ali and Paolo Arcaini	
	Degrees of Autonomy in Coordinating Collectives of Self-Driving Vehicles Franco Zambonelli, Stefano Mariani	Uncertainty Quantification and runtime monitoring using Environment-aware DTs James Woodcock, Cláudio Gomes, Hugo Daniel Macedo, Peter Gorm Larsen	
	Engineering semantic self-composition of services through tuple-based coordination Ashley Caselli, Giovanni Ciatto, Giovanna Di Marzo Serugendo, Andrea Omicini	Designing Distributed Control with Hybrid Active Objects Eduard Kamburjan, Rudolf Schlatte, Einar Broch Johnsen, S. Lizeth Tapia Tarifa	
10:30-11:00	COFFEE BREAK		
	Rigorous Engineering of Collective Adaptive Systems ATTRIBUTE-BASED COORDINATION ROOM A	Engineering of Digital Twins for Cyber-Physical Systems ROOM B	Rigorous Examination of Reactive Systems (RERS) ROOM C
11:00-12:30	A Dynamic Logic for Systems with Predicate-based Communication Rolf Hennicker, Martin Wirsing	Digital Modelling in the Railways Lecomte, Thierry	
	Verifying AbC specifications via emulation Omar Inverso, Tan Duong, Rocco De Nicola	Engineering a DT for Manual Assembling Alexandru Matei, Nicolae-Adrian Ţocu, Constantin-Bălă Zamfirescu, Arpad Gellert, Mihai Neghină	
	Abstractions for Collective Adaptive Systems Omar Inverso, Emilio Tuosto, Catia Trubiani	Discussion: What foundations are needed to take the engineering methods and tools for DTs to the next level?	
12:30-14:30	LUNCH		

	Rigorous Engineering of Collective Adaptive Systems COORDINATION AND COMPOSITION ROOM A	Engineering of Digital Twins for Cyber-Physical Systems ROOM B	Doctoral Symposium ROOM C
14:30-16:00	Adaptive Security Policies Flemming Nielson, René Rydhof Hansen, Hanne Riis Nielson	Towards a Digital twin – Modelling an Agricultural Vehicle Frederik F Foldager, Casper Thule, Ole Balling, Peter Gorm Larsen	Towards the combination of proof tools for modeling and verifying hybrid systems Marius Hinge
	Capturing Dynamicity and Uncertainty in Security and Trust via Situational Patterns Tomas Bures, Petr Hnetynka, Robert Heinrich, Stephan Seifermann, Maximilian Walter	Towards Digital Twins for Knowledge-driven Construction Progress and Predictive Safety Analysis on a Construction Site Beidi Li, Rasmus O. Nielsen, Karsten W. Johansen, Jochen Teizer, Peter Gorm Larsen, Carl Schultz	Data Dependence Verification of Distributed Stencil Algorithms Asmae Heydari Tabar
	Guaranteeing Type Consistency in Collective Adaptive Systems Jonas Schürmann, Tim Tegeler, Bernhard Steffen	Continued discussion: What foundations are needed to take the engineering methods and tools for DTs to the next level?	Automated Deductive Verification of Safety-Critical Embedded Software Christian Lidström
			Gaining Understanding from Decision-Tree based Diagnostics Barbara Steffen
			The Domain Specific Language Platform for Knowledge Management Stephen Ryan
16:00-16:30 COFFEE BREAK			
	Rigorous Engineering of Collective Adaptive Systems SPECIFYING ENSEMBLES AND COMPUTING WITH THEM ROOM A	INTO-CPS Association – General Assembly ROOM B	Doctoral Symposium ROOM C
16:30-18:00	Epistemic Logic in Ensemble Specification Jan Sürmeli	INTO-CPS Association General Assembly (Hybrid)	Applications of Deontic Logic in Wearable Robots Dimitrios Zafeirakopoulos
	FScaFi: a Core Calculus for Collective Adaptive Systems Programming Roberto Casadei, Mirko Viroli, Ferruccio Damiani, Giorgio Audrito		MazeGen: An Evolutionary Approach for Creating Robotic Navigation Scenarios Ivan Guevara,
	Writing Robotics Applications with X-Klaim Lorenzo Bettini, Khalid Bourr, Rosario Pugliese, Francesco Tiezzi		DSL-based Interoperability and Integration in the Smart Manufacturing Digital Thread Hafiz Ahmad Awais Chaudhary
			Historical Knowledge Interoperability: A New Generation Data Management Platform for Digital Humanities using Model Driven Development Rafflesia Khan
			Automating the Referral Pathways for Multiple Myeloma through a Web Application and XMDD Adam Doherty

	Rigorous Engineering of Collective Adaptive Systems MACHINE LEARNING AND EVOLUTIONARY COMPUTING FOR COLLECTIVE ADAPTIVE SYSTEMS ROOM A	Formal methods for DIStributed COmputing in future RAILWay Systems (DisCo Rail 2020) DISTRIBUTED INTERLOCKING ROOM B	X-by-Construction: Correctness meets Probability ROOM C
09:00-10:30	Forming Ensembles at Runtime: A Machine Learning Approach Tomas Bures, Ilias Gerostathopoulos, Petr Hnetyuka, Jan Pacovsky	Formal methods for Distributed Computing in future Railway systems Alessandro Fantechi, Stefania Gnesi, Anne E. Haxthausen	Opening – Maurice ter Beek (ISTI-CNR, Pisa, Italy) Keynote Speech (09:05 – 10:05)
	Synthesizing Control for a System with Black Box Environment, based on Deep Learning Simon Iosti, Doron Peled, Khen Aharon, Saddek Bensalem, Yoav Goldberg	New Distribution Paradigms for Railway Interlocking Jan Peleska	Correctness by Construction for Probabilistic Programs Carroll Morgan (Macquarie U & UNSW, Sydney, Australia)
	A Formal Model For Reasoning About The Ideal Fitness In Evolutionary Processes Thomas Gabor, Claudia Linnhoff-Popien	Model Checking a Distributed Interlocking System Using k-induction with RT-Tester Signe Geisler, Anne E. Haxthausen	Invited Speech (10:05 – 10:25) Components in Probabilistic Systems: Suitable by Construction Clemens Dubslaff (TU Dresden, Germany)
		Formal Modelling and Verification of a Distributed Railway Interlocking System Using UPPAAL Per Lange Laursen, Van Anh Thi Trinh, Anne E. Haxthausen	Discussion
10:30-11:00	COFFEE BREAK		
	Rigorous Engineering of Collective Adaptive Systems PROGRAMMING AND ANALYSING ENSEMBLES OF ROBOTS ROOM A	Formal methods for DIStributed COmputing in future RAILWay Systems (DisCo Rail 2020) PROJECT REPORTS ROOM B	X-by-Construction: Correctness meets Probability ROOM C
11:00-12:30	A case study of policy synthesis for swarm robotics Paul Piho, Jane Hillston Maple-Swarm: Programming	RAILway systems RAILS: Roadmaps for AI integration in the rail Sector Vittorini, Valeria, Flammini, Francesco	Behavioral Specification Theories: an Algebraic Taxonomy Uli Fahrenberg, Axel Legay
	Maple-Swarm: Programming Collective Behavior for Ensembles by extending HTN-Planning Oliver Kosak, Lukas Huhn, Constantin Wanning, Alwin Hoffmann, Wolfgang Reif	A Journey through Software Model Checking of Interlocking Programs Simon Chadwick, Phillip James, Faron Moller, Markus Roggenbach, and Thomas Werne	Approximating Euclidean by Imprecise Markov Decision Processes Manfred Jaeger, Giorgio Bacci, Giovanni Bacci, Kim Guldstrand Larsen, Peter Jensen

	<p>Rigorous Engineering of Collective Adaptive Systems PROGRAMMING AND ANALYSING ENSEMBLES OF ROBOTS</p> <p>ROOM A</p>	<p>Formal methods for DIStributed COmputing in future RAILWay Systems (DisCo Rail 2020) PROJECT REPORTS</p> <p>ROOM B</p>	<p>X-by-Construction: Correctness meets Probability</p> <p>ROOM C</p>
11:00-12:30	<p>Swarm and Collective Capabilities for Multipotent Robot Ensembles Oliver Kosak, Felix Bohn, Lennart Eing, Dennis Rall, Constantin Wanninger, Alwin Hoffmann, Wolfgang Reif</p>	<p>Supporting the Development of Hybrid ERTMS/ETCS Level 3 with Formal Modelling, Analysis and Simulation Maarten Bartholomeus, Rick Erkens, Bas Luttkik, Tim Willemse</p>	<p>Shield Synthesis for Reinforcement Learning Bettina Könighofer, Florian Lorber, Nils Jansen, Roderick Bloem</p>
		<p>Formal Methods in Railway Signalling Infrastructure Standardisation Processes Mark Bouwman, Bas Luttkik, Arend Rensink, Marielle Stoelinga, Djurre van der Wal</p>	<p>Inferring Performance From Code: A Review Emilio Incerto, Annalisa Napolitano, Mirco Tribastone</p>
12:30-14:30 LUNCH			
	<p>Rigorous Engineering of Collective Adaptive Systems VALIDATING AND ANALYSING COLLECTIVE ADAPTIVE SYSTEMS I</p> <p>ROOM A</p>	<p>Formal methods for DIStributed COmputing in future RAILWay Systems (DisCo Rail 2020) DESIGN OF ADVANCED TRAIN CONTROL SYSTEMS</p> <p>ROOM B</p>	<p>30 years of Statistical Model Checking!</p> <p>ROOM C</p>
14:30-16:00	<p>Measuring Adaptability and Reliability of Large Scaled Systems Valentina Castiglioni, Michele Loreti, Simone Tini</p>	<p>Designing a Demonstrator of Formal Methods for Railways Infrastructure Managers Davide Basile, Maurice ter Beek, Alessandro Fantechi, Alessio Ferrari, Laura Masullo, Andrea Piattino, Daniele Trentini, Stefania Gnesi, Franco Mazzanti</p>	<p>30 years of Statistical Model Checking Axel Legay, Kim Guldstrand Larsen</p>
	<p>Centrality-preserving exact reductions of Multi-Layer Networks Stefano Tognazzi, Tatjana Petrov</p>	<p>Ensuring Safety with System Level Formal Modelling Thierry Lecomte, Mathieu Comptier, Julien Molinero, Denis Sabatier</p>	<p>Statistical Model Checking: Black or White? Jan Kretinsky, Maximilian Weininger, Pranav Ashok</p>
	<p>Towards Dynamic Dependable Systems through Evidence-Based Continuous Certification Rasha Faqeh, Christof Fetzer, Holger Hermanns, Jörg Hoffmann, Marcel Steinmetz, Christoph Weidenbach, Michaela Klauck, Maximilian Köhl</p>	<p>A modular design framework to assess intelligent trains Simon Collart-Dutilleul, Philippe Bon</p>	<p>Probabilistic Mission Planning and Analysis for Multi-agent Systems Rong Gu, Eduard Enoiu, Cristina Seceleanu, Kristina Lundqvist</p>
16:00-16:30 COFFEE BREAK			

	<p>Rigorous Engineering of Collective Adaptive Systems VALIDATING AND ANALYSING COLLECTIVE ADAPTIVE SYSTEMS II AND CLOSING OF REOCAS ROOM A</p>	<p>Formal methods for DIStributed COmputing in future RAILway Systems (DisCo Rail 2020) OPEN DISCUSSION ROOM B</p>	<p>30 years of Statistical Model Checking! ROOM C</p>
<p>16:30-18:00</p>	<p>Verifying temporal properties of stigmergic collective systems using CADP Luca Di Stefano, Frederic Lang</p> <hr/> <p>Closing of the REoCas Track Martin Wirsing, RoccoDe Nicola, Stefan Jähnichen</p>	<p>Open Discussion</p>	<p>30 Years of Simulation-Based Quantitative Analysis Tools: a Comparison Experiment between Möbius and Uppaal SMC Davide Basile, Maurice ter Beek, Felicità Di Giando Menico, Alessandro Fantechi, Stefania Gnesi, Giorgio Oronzo Spagnolo</p> <hr/> <p>Fluid Model-Checking in UPPAAL for Covid-19 Peter Gjøøl Jensen, Kenneth Yrke Jørgensen, Kim Guldstrand Larsen, Marius Mikučionis, Marco Muniz, Danny Bøgstved Poulsen</p> <hr/> <p>Improving Secure and Robust Patient Service Delivery Eduard Baranov, Thomas Given-Wilson, Axel Legay</p>

	Modularity and (De-)composition in Verification ROOM A	Workshop on WHY ROOM B	
09:00-10:30	Who Carries the Burden of Modularity? Dilian Gurov, Reiner Hähnle, Eduard Kamburjan		
	On Testing Message-Passing Components Alex Coto, Emilio Tuosto, Roberto Guanciale		
	Composing Communicating Systems, Synchronously Franco Barbanera, Ivan Lanese, Emilio Tuosto		
	Modular Verification of JML Contracts Using Bounded Model Checking Bernhard Beckert, Michael Kirsten, Jonas Klamroth, Mattias Ulbrich		
10:30-11:00	COFFEE BREAK		
	Modularity and (De-)composition in Verification ROOM A	Workshop on WHY ROOM B	
11:00-12:30	On Slicing Software Product Line Signatures Ferruccio Damiani, Michael Lienhardt, Luca Paolini		
	Assumption-Commitment Types for Resource Management in Virtually Timed Ambients Einar Broch Johnsen, Martin Steffen, Johanna Beate Stumpf		
	Abstraction and Genericity in Why3 Andrei Paskevich, Jean-Christophe Filliâtre		
12:30-14:30	LUNCH		

	Modularity and (De-)composition in Verification ROOM A	STTT Editorial Meeting ROOM B	
14:30-16:00	Verification Artifacts in Cooperative Verification: Survey and Unifying Component Framework Dirk Beyer, Heike Wehrheim		
	An Interface Theory for Program Verification Dirk Beyer, Sudeep Kanav		
	Scaling Correctness-by-Construction Alexander Knüppel, Tobias Runge, Ina Schaefer		
16:00-16:30 COFFEE BREAK			
		STTT Editorial Meeting ROOM B	
16:30-18:00			