

Modelica 2021 program

Monday, 20/09

	Tutorials				
9.00-10:30	Room A: FMI in the Cloud, Torsten, Sommer	Room B : Introduction to Modeling, Simulation, Debugging, and Interoperability with Modelica and OpenModelica	Room C : Modelica Buildings Library	Room D: Introduction to Modelica with Modelon Impact	Room E: Energy and thermal management of an electrical vehicle
	Break on wonder.me				
11.00-12:30	Room A: FMI in the Cloud, Torsten, Sommer	Room B : Introduction to Modeling, Simulation, Debugging, and Interoperability with Modelica and OpenModelica	Room C : Modelica Buildings Library	Room D: Introduction to Modelica with Modelon Impact	Room E: Energy and thermal management of an electrical vehicle
	Lunch				
13:30- 14:15	Opening introduction from chairs, Modelica Association News				
14:15-15:00	Keynote: Viral Shah, Chris Rackauckas and Chris Laughman, New Horizons in Modeling and Simulation with Julia				
	Break on wonder.me				
	Session 1A		Session 1B		
15:30-15:50	10 - The Functional Mock-up Interface 3.0 - New Features Enabling New Applications, Andreas Junghanns, Torsten Blochwitz, Christian Bertsch, Torsten Sommer, Karl Wernersson, Andreas Pillekeit, Irina Zacharias, Matthias Blaesken, Pierre R. Mai, Klaus Schuch, Christian Schulze, Cláudio Gomes and Masoud Najafi		49 - Modia - Equation Based Modeling and Domain Specific Algorithms, Hilding Elmqvist, Martin Otter, Andrea Neumayr and Gerhard Hippmann		
15:50-16:10	4 - The FMI 3.0 Standard Interface for Clocked and Scheduled Simulations, Cláudio Gomes, Masoud Najafi, Torsten Sommer, Matthias Blesken, Irina Zacharias, Oliver Kotte, Pierre R. Mai, Klaus Schuch, Karl Wernersson, Christian Bertsch, Torsten Blochwitz and Andreas Junghanns		65 - Modia and Julia for Grey Box Modeling, Frederic Bruder and Lars Mikelsons		
16:10-16:30	42 - Engineering Domain Interoperability Using the System Structure and Parameterization (SSP) Standard, Robert Hällqvist, Raghu Chaitanya Munjulury, Robert Braun, Magnus Eek and Petter Krus		79 - Composing Modeling and Simulation with Machine Learning in Julia, Chris Rackauckas, Ranjan Anantharaman, Alan Edelman, Shashi Gowda, Maja Gwozdz, Anand Jain, Chris Laughman, Yingbo Ma, Francesco Martinuzzi, Avik Pal, Utkarsh Rajput, Elliot Saba and Viral Shah		
16:30-16:50	34 - eFMI: An open standard for physical models in embedded software, Oliver Lenord, Martin Otter, Christoff Bürger, Michael Hussmann, Pierre Le Bihan, Jörg Niere, Andreas Pfeiffer, Robert Reicherdt and Kai Werther		75 - OpenModelica.jl: A modular and extensible Modelica compiler framework in Julia targeting ModelingToolkit.jl, John Tinnerholm, Adrian Pop, Andreas Heuermann and Martin Sjölund		
16:50-17:10	18 - Modelica, FMI and SSP for LOTAR of analytical mBSE models: First implementation and feedbacks, Clément Coïc, Adrian Murton, Juan Carlos Mendo, Mark Williams, Hubertus Tummescheit and Kurt Woodham				

Tuesday, 21/09

	Session 2A	Session 2B
08:50-09:10	3 - Investigating Steady State Initialization for Modelica models, Hans Olsson and Erik Henningsson	22 - Aircraft Mission Simulation with the updated FlightDynamics Library, Marc May, Reiko Mueller and Gertjan Looye
09:10-09:30	5 - New Equation-based Method for Parameter and State Estimation, Luis Corona Mesa-Moles, Erik Henningsson, Daniel Bouskela, Audrey Jardin and Hans Olsson	15 - Modelica-Based Modeling on LEO Satellite Constellation, Liu Chan, Chen Liping, Qu Yan, Zhou Fanli and Qian Yikai
09:30-09:50	1 - Efficient Parameterization of Modelica Models, Thomas Beutlich and Dietmar Winkler	67 - Guidance, Navigation, and Control enabling Retrograde Landing of a First Stage Rocket, Christian Canham, Meaghan Podlaski and Luigi Vanfretti
09:50-10:10	47 - Power Flow Record Structures to Initialize OpenIPSL Phasor Time-Domain Simulations with Python, Sergio A. Dorado-Rojas, Giuseppe Laera, Marcelo de Castro Fernandes, Tetiana Bogodorova and Luigi Vanfretti	64 - An Ice Storage Tank Modelica Model: Implementation and Validation, Guowen Li, Yangyang Fu, Amanda Pertzborn, Jin Wen and Zheng O'Neill
	Break on wonder.me	
	Session 3A	Session 3B
10:40-11:00	12 - Status of the TransiEnt Library: Transient Simulation of Complex Integrated Energy Systems, Anne Senkel, Carsten Bode, Jan-Peter Heckel, Oliver Schülting, Gerhard Schmitz, Christian Becker and Alfons Kather	50 - The Potential of FMI for the Development of Digital Twins for Large Modular Multi-Domain Systems, Marcus Wiens, Tobias Meyer and Philipp Thomas
11:00-11:20	30 - DLR Visualization 2 Library - Real-Time Graphical Environments for Virtual Commissioning, Sebastian Kümper, Matthias Hellerer and Tobias Bellmann	26 - Object-oriented Digital Twins of Parallel Manipulators, Paolo Campanini and Gianni Ferretti
11:20-11:40	39 - Towards a Modelica OPC UA Library for Industrial Automation, Bernhard Thiele	60 - A Modelica Library for Modelling of Electrified Powertrain Digital Twins, Nikolaos Fotias, Ran Bao, Hui Niu, Michael Tiller, Paul McGahan and Adam Ingleby
11:40-12:00	46 - A Modelica library for Thermal-Runaway Propagation in Lithium-Ion Batteries, Christian Groß and Andrej W. Golubkov	77 - Development of a real-time test bed for indoor climate simulation in a VR environment using a digital twin, Christoph Nytsch-Geusen, Kushagra Mathur and Lucas Westermann
12:00-12:20	51 - The DLR ThermoFluidStream Library, Dirk Zimmer, Niels Weber and Michael Meißner	29 - A first principles thermal losses model of the TCP-100 parabolic trough collector based on the Modelica Standard Library, Julia Pérez, Luis J. Yebra, Francisco M. Márquez and Pedro J. Zufiria
	Lunch	
13:30- 14.15	VENDOR SESSION: Wolfram System Modeler and Virtual Labs	
14:30-15.15	VENDOR SESSION : ThermoAnalytics : Using FMI for transient heat transfer simulation of 1D system models and TAItherm 3D thermal models	
15:30-16.15	VENDOR SESSION : Maplesoft: MapleSim 2021	
16:30-17.15	VENDOR SESSION : OpenModelica – Status and News on OpenModelica Development and Applications	

Wednesday, 22/09

8:30-9.15	VENDOR SESSION : Toshiba Digital Solutions Corporation: Distributed Co-simulation Platform - VenetDCP	
9:30-10.15	VENDOR SESSION : Implementing multi-fmu simulation with a cosimulation platform	
	Break on wonder.me	
10:30-11.15	VENDOR SESSION : Dynawo: an hybrid C++/Modelica open-source suite of simulation tools for power systems	
11:30-12.15	VENDOR SESSION : Dassault Systèmes Vendor Session	
	Lunch	
13:30-14.15	VENDOR SESSION : Modelon Impact - System Simulation for Everyone	
	Session 4A	Session 4B
14:20-14:40	23 - Electromagnetic Transient Modeling of Large Power Networks with Modelica, Alireza Masoom, Jean Mahseredjian, Tarek Ould-Bachir and Adrien Guironnet	13 - Detailed White-Box Non-Linear Model Predictive Control for Scalable Building HVAC Control, Anne Senkel, Carsten Bode, Jan-Peter Heckel, Oliver Schülting, Gerhard Schmitz, Christian Becker and Alfons Kather
14:40-15:00	7 - Seismic Hybrid Testing using FMI-based Co-Simulation, Cláudio Gomes, Giuseppe Abbiati and Peter Gorm Larsen	31 - Software Architecture and Implementation of Modelica Buildings Library Coupling for Spawn of EnergyPlus
15:00-15:20	24 - NeuralFMU: Towards Structural Integration of FMUs into Neural Networks, Tobias Thummerer, Lars Mikelsons and Josef Kircher	62 - Coupling physical and machine learning models: case study of a residential building, Sebastian Kümper, Matthias Hellerer and Tobias Bellmann
15:20-15:40	58 - Sensitivity Analysis of a Car Shock Absorber Through a FMU-Based Modeling Strategy, Bruno Vuillod, Ludovic Hallo, Enrico Panettieri and Marco Montemurro	66 - Underfloor heating system model for building performance simulations, Stephan Göbel, Elaine Schmitt, Philipp Mehrfeld and Dirk Müller
	Break on wonder.me	
	Session 5A	Session 5B
16:10-16:30	48 - ScalableTestGrids - An Open-Source and Flexible Benchmark to Assess Modelica Tool Performance on Large-Scale Power System Test Cases, Francesco Casella and Adrien Guironnet	44 - A Cloud-native Implementation of the Simulation as a Service-Concept Based on FMI, Moritz Stüber and Georg Frey
16:30-16:50	56 - Continuous Development and Management of Credible Modelica Models, Luxshan Manoranjan and Dietmar Winkler	59 - Python Framework for Wind Turbines Enabling Test Automation of MoWiT, Johannes Fricke, Marcus Wiens, Niklas Requate and Mareike Leimeister
16:50-17:10	2- Modeling of A Bearing Test Bench and Analysis of Defect Bearing Dynamics in Modelica, Diwang Ruan, Zhirou Li and Clemens Gühmann, Tobias Thummerer, Lars Mikelsons and Josef Kircher	61 - A GraphBased Meta-Data Model for DevOps in Simulation Driven Development and Generation of DCP Configurations, Stefan H. Reiterer and Clemens Schiffer
17:10-17:30	25 - Modelica Models as Integral Part of the Building Design Process, Torsten Schwan, Monika Wicke, Alexander Hentschel and René Unger	41 - Creating portable, language-agnostic FMUs: A Case Study in Robotics using UniFMU, Thomas Schranz, Christian Møldrup Legaard, Daniella Tola and Gerald Schweiger

Thursday, 23/09, morning

	Session 6A	Session 6B
08:50-09:10	36 - General Purpose Lua Interpreter for Modelica, Fabian Buse and Tobias Bellmann	11 - Use of Modelica to predict risk of Covid-19 infection in indoor environments, Arnav Pathak, Kilian Schneider and Victor Norrefeldt
09:10-09:30	8 - Object Manipulation and Assembly in Modelica, Robert Reiser	63 - Model-Based Development of the RespiraWorks Ventilator with Modelon Impact, John Batteh, Lixiang Li, Edwin Chiu and Ethan Chaleff
09:30-09:50	9 - A Portable and Secure Package Format for Executable Simulation Modules based on WebAssembly, Moritz Allmaras, Andr�s Botero Halblaub, Harald Held and Tim Schenk	81 - In-silico virtual prototyping multilevel modeling system for Cyborgs (CybSim) as a novel approach for current challenges in biosciences, Manuel Prado-Velasco
09:50-10:10	6 - New Method to Perform Data Reconciliation with OpenModelica and ThermoSysPro, Daniel Bouskela, Audrey Jardin, Arunkumar Palanisamy, Lennart Ochel and Adrian Pop	52 - Decarbonization of industrial energy systems: A case study of printed circuit board manufacturing, Carles Ribas Tugores, Gerald Birngruber, J�rgen Fluch, Angelika Swatek and Gerald Schweiger
	Break on wonder.me	
	Session 7A	Session 7B
10:40-11:00	17 - Handling Multimode Models and Mode Changes in Modelica, Albert Benveniste, Beno�t Caillaud and Mathias Malandain	35 - A Modular Model of Reversible Heat Pumps and Chillers for System Applications, Fabian W�llhorst, David Jansen, Philipp Mehrfeld and Dirk M�ller
11:00-11:20	69 - A Reduced Index Mode-Independant Structure Model Transformation for Multimode Modelica Models	37 - Modelica Modeling and Simulation for a Micro Gas-Cooled Reactor, Zhang Huimin, Liang Yangyang, Wang Li, Du Shuhong, Wang Jun, Chen Liping, Zhou Fanli, Ding Ji and Zhang Haiming
11:20-11:40	14 - Evaluating a Tree Diff Algorithm for Use in Modelica Tools	40 - Energy-based Method to Simplify Complex Multi-Energy Modelica Models, Joy El Feghali, Guillaume Sandou, Herv� Gu�guen, Pierre Haessig and Damien Faille
11:40-12:00	28 - Numerically Robust Six-Equation Two-Phase Flow Model for Stationary and Moving Systems in Modelica	33 - A Case Study on Condenser Water Supply Temperature Optimization with a District Cooling Plant, Oliver Lenord, Martin Otter, Christoff B�rger, Michael Hussmann, Pierre Le Bihan, J�rg Niere, Andreas Pfeiffer, Robert Reicherdt and Kai Werther
12:00-12:20	16 - Compile Time Impulse Analysis in Modelica, Albert Benveniste, Beno�t Caillaud and Mathias Malandain	27- Long Term Technical and Economic Evaluation of Hydrogen Storage Technologies for Energy Autarkic Residential Complexes, Lucas Schindhelm, Ales Vojacek and Johannes Brunnemann
	Lunch	

Thursday, 23/09, afternoon

	"FMI Industrial User Meeting – Industrial Usage of FMI and Companion Standards SSP / DCP/ eFMI"
13.30-13.35	Welcome, Overview on FMI / SSP / DCP / eFMI Standards
13.35-13.50	Initial Steps in Deploying and Calibrating Power System Models on a Synchrophasor Data Cloud Platform using FMI, Luigi Vanfretti, Giuseppe Laera, Marcelo de C. Fernandes, Chen Wang, Chetan Mishra and Kevin D. Jones
13.50-14.05	FMI-based simulation workflows based on open source and commercial tools, Christian Bertsch, Fabian Jansen, Andreas Babucke and Torsten Sommer
14.05-14.20	Open Simulation Platform - Towards a maritime ecosystem for efficient co-simulation , Lars Tandle Kyllingstad
14.20-14.35	FMI3 development (Status, roadmap, layered standards), Andreas Junghanns
	Short Break (10 Min)
14.45-14.50	Status and outlook SSP Standard, Jochen Köhler
14.50-15.05	Use of SSP, FMI and OSI for Simulation-based Testing of an Automated Vehicle, Jochen Koehler, Heinz Sachsenweger, Arun Das, Markus Deppe and Hans-Martin Heinkel
15.05-15.20	Model-based development of a traction control unit with SSP and FMI, Nicolas Ochoa Lleras, Hasan Esen, Pierre Mai, Klaus Mai and Hiroshi Tashiro
15.20-15.35	SSP Traceability Demonstrator, Dag Brück, Hans-Martin Heinkel, Peter Lobner and Pierre Mai
15.35-15.50	Status and Outlook DCP Standard, Martin Krammer
15.50-16.05	Status and Outlook eFMI Standard, Christoff Bürger
	General Q&A + End

Friday, 24/09

09.10-09.15	MODELICA INDUSTRIAL USER SESSION, Introduction, Martin Otter	
09.15-09.40	Engineering Simulation Digital Twin of Hybrid Renewable Energy System by Modelica, Walid Adra	
09.40-10.05	Excavator Simulation Conducted by MWorks with Real Controller Network Communication, Tianjun Zhang, Hao Yang, Fanli Zhou, Liping Chen, Qi Liu and Lu Chen	
10.05-10.30	Building digital twins for AI based root cause analysis, Valentin Drouet and Laurent Muszynski	
	Break on wonder.me	
11.00-11.25	A resume of the ways to improve connection between FEM and OpenModelica, Marco Mastroeni	
11.25-11.50	Optimize a multisubstance goal throughout a complex value chain, Anas Lahlou, Jean Michel Ghidaglia and John Redford	
11.50-12.00	Session closing and discussion	
	Lunch	
	Session 8A	Session 8B
13:30-13:50	54 - Modelling the Synchronisation Control for a Hydro Power Controller, Nejm Saadallah and Yngve Heggelund	74 - Parallel Fast: An Efficient Coupling Approach for Co-Simulation with Different Coupling Step Sizes, Franz Holzinger, Klaus Schuch, Martin Benedikt and Daniel Watzenig
13:50-14:10	55 - Developing Protective Limiters for a Hydro Power Controller in Modelica, Luxshan Manoranjan and Dietmar Winkler	71 - Towards an automated generator of urban building energy loads from 3D building models
14:10-14:30	53 - An Approach for Reducing Gas Turbines Usage by Wind Power and Energy Storage, Nejm Saadallah and Yngve Heggelund	73 - Examination of Reduced Order Building Models with Different Zoning Strategies to Simulate Larger Non-Residential Buildings Based on BIM as Single Source of Truth, David Jansen, Veronika Richter, Diego Cordoba Lopez, Philipp Mehrfeld, Jérôme Frisch, Dirk Müller and Christoph van Treeck
14:30-14:50	57 - Implementation and Validation of the Generic WECC Photovoltaics and Wind Turbine Generator Models in Modelica, Maria Nuschke, Sören Lohr, Adrien Guironnet and Marianne Saugier	38 - Accurate Robot Simulation for Industrial Manufacturing Processes using FMI and DCP Standards, Nihar Hasmukhbhai Shah, Perig Le Henaff, Clemens Schiffer, Martin Krammer and Martin Benedikt
14:50-15:10	80 - Modeling of Recompression Brayton Cycle And CSP Plant Architectures for Estimation of Performance & Efficiency, Ashok Kumar Ravi, Stephane Velut and Raja Vignesh Srinivasan	19 - Optimizing life-cycle costs for pumps and powertrains using FMI co-simulation, Miro Eklund, Jouni Savolainen, Antti Lukkari and Tommi Karhela
	Break on wonder.me	
15:40-16:25	Keynote: Michael Wetter, How can the Modelica community support the transition to decarbonized, grid-flexible buildings?	
16:25-16:35	Library award, Conference closing	