Modelica 2021 program

Monday, 20/09, time zone CEST

	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: *New Horizons in Modeling and Simulation with Julia, Viral Shah, Chris Rackauckas and Chris Laughman*				
	Break on wonder.me				
	Session 1A: open standards (1) FMI/SSP, chair TBD		Session 1B: Julia, chair Peter Frizson		
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	8 - *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		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	134 - *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				

Tuesday, 21/09, time zone CEST

	Session 2A: initialisation and parametrization, chair : Martin Otter	Session 2B: applications (1), chair : Dan Henriksson
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 – libraries, chair: Francesco Casella	Session 3B: digital twins, chair TBA
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 inLithium-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, time zone CEST

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 : Dynaωo: 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: applications (2), chair: TBA	Session 4B: buildings - Hubertus Tummescheit
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,* Michael Wetter, Kyle Benne and Baptiste Ravache
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: testing, chiar: Anton Haumer	Session 5B: open standards (2) FMI/DCP
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, time zone CEST

	Session 6A: interoperability, chair: Dirk Zimmer	Session 6B : applications (3), chair: Bernhard Thiele
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, Andrès 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 biosciencies, 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, Jürgen Fluch, Angelika Swatek and Gerald Schweiger
	Break on wonder.me	
	Session 7A : Modelica Language - Hilding Elmqvist	Session 7B : energy (1) - Dietmar Winkler
10:40-11:00	17 - *Handling Multimode Models and Mode Changes in Modelica*, Albert Benveniste, Benoît Caillaud and Mathias Malandain	35 - A Modular Model of Reversible Heat Pumps and Chillers for System Applications, Fabian Wüllhorst, David Jansen, Philipp Mehrfeld and Dirk Müller
11:00-11:20	69 - *A Reduced Index Mode-Independant Structure Model Transformation for Multimode Modelica Models*, Benoît Caillaud, Mathias Malandain and Albert Benveniste	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, Martin Sjölund	40 - Energy-based Method to Simplify Complex Multi-Energy Modelica Models, Joy El Feghali, Guillaume Sandou, Hervé Guéguen, 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*, Lucas Schindhelm, Ales Vojacek and Johannes Brunnemann	33 - A Case Study on Condenser Water Supply Temperature Optimization with a District Cooling Plant, Oliver Lenord, Martin Otter, Christoff Bürger, Michael Hussmann, Pierre Le Bihan, Jörg Niere, Andreas Pfeiffer, Robert Reicherdt and Kai Werther
12:00-12:20	16 - *Compile Time Impulse Analysis in Modelica*, Albert Benveniste, Benoît 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, time zone CEST

	“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 Kylinngstad
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, time zone CEST

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: energy (2) - Luigi Vanfretti	Session 8B : applications (3) FMI - Christian Bertsch
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*, Alessandro Maccarini, Michael Mans, Christian Grau Sørensen and Alireza Afshari
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: How can the Modelica community support the transition to decarbonized, grid-flexible buildings?, Michael Wetter	
16:25-16:35	Library award, Conference closing	