

# EMPHYSIS

## Dissemination Results

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## List of Publications

Citable publications, e.g. books, journals, conference proceedings, patents, standards,....

### 2021

- [1] Armugham, Siva Sankar, Christian Bertsch, Oliver Lenord, and Kai Werther. 2021. "EFMI (FMI for Embedded Systems) in AUTOSAR for Next Generation Automotive Software Development." In *Symposium on International Automotive Technology (SIAT)*. Pune, India. (abstract accepted)
- [2] Martin Sjölund, Oliver Lenord, Hans Olsson, Henrik Tiddefelt, Kai Werther, and Adrian Pop (2021). "Towards a simplified form of Modelica without object-orientation" *Electronics* (submitted)

### 2020

- [3] Peter Fritzson, Adrian Pop, Karim Abdelhak, Adeel Ashgar, Bernhard Bachmann, Willi Braun, Daniel Bouskela, Robert Braun, Lena Buffoni, Francesco Casella, Rodrigo Castro, Rüdiger Franke, Dag Fritzson, Mahder Gebremedhin, Andreas Heuermann, Bernt Lie, Alachew Mengist, Lars Mikelsons, Kannan Moudgalya, Lennart Ochel, Arunkumar Palanisamy, Vitalij Ruge, Wladimir Schamai, Martin Sjölund, Bernhard Thiele, John Tinnerholm, and Per Östlund (2020). "The OpenModelica Integrated Environment for Modeling, Simulation, and Model-Based Development". *Modeling, Identification and Control* 41, no. 4: 241-295. <http://dx.doi.org/10.4173/mic.2020.4.1>
- [4] Karthik Murali Madhavan Rathai, Mazen Alamir, Olivier Sename, (2020) "GPU based Stochastic Parameterized NMPC scheme for Control of Semi-Active Suspension System for Half Car Vehicle", *IFAC World Congress 2020*, Berlin, Germany
- [5] Manh-Hung Do, Damien Koenig, and Didier Theilliol (2020). "H-infinity observer design for Singular Nonlinear Parameter-varying System". In *2020 59th IEEE Conference on Decision and Control (CDC)*. IEEE.
- [6] Manh-Hung Do, Damien Koenig, and Didier Theilliol (2020). "Fault estimation methods in descriptor system with partially decoupled disturbances." In *2020 21st IFAC World Congress*. IFAC.
- [7] Manh-Hung Do, Damien Koenig, and Didier Theilliol (2020). "Robust H-infinity proportional-integral observer-based controller for uncertain LPV system". *Journal of the Franklin Institute*. Vol. 357 (4), 2099-2130.
- [8] Bert Van Acker, Bentley James Oakes, Mehrdad Moradi Paul De Meulenaere and Joachim Denil (2020). "Validity Frame Concept as Effort-Cutting Technique within the Verification and Validation of Complex Cyber-Physical Systems". In *17th Workshop on Model Driven Engineering, Verification and Validation (MoDeVVA)*
- [9] Van Acker B., Vanommeslaeghe Y., De Meulenaere P., Denil J. (2020) Validity Frame Driven Computational Design Synthesis for Complex Cyber-Physical Systems. In: Babur Ö., Denil J., Vogel-Heuser B. (eds) *Systems Modelling and Management*. ICSMM 2020.

Communications in Computer and Information Science, vol 1262. Springer, Cham.  
[https://doi.org/10.1007/978-3-030-58167-1\\_7](https://doi.org/10.1007/978-3-030-58167-1_7)

- [10] Van Mierlo S., Oakes B.J., Van Acker B., Eslampanah R., Denil J., Vangheluwe H. (2020) Exploring Validity Frames in Practice. In: Babur Ö., Denil J., Vogel-Heuser B. (eds) Systems Modelling and Management. ICSMM 2020. Communications in Computer and Information Science, vol 1262. Springer, Cham. [https://doi.org/10.1007/978-3-030-58167-1\\_10](https://doi.org/10.1007/978-3-030-58167-1_10)
- [11] The Validity Frame concept – Foundations [Pending journal - preprint on svn]
- [12] Validity Frame Concept as Effort-cutting Technique within the Verification of Cyber-Physical Systems [Pending journal - preprint on svn]

## 2019

- [13] Alachew Mengist (2019), “Methods and Tools for Efficient Model-Based Development of Cyber-Physical Systems with Emphasis on Model and Tool Integration” (licentiate diss., Linköping University). <https://doi.org/10.3384/lic.diva-156690>
- [14] John Tinnerholm, Martin Sjölund, and Adrian Pop (2019). Towards introducing just-in-time compilation in a Modelica compiler. In *Proceedings of the 9th International Workshop on Equation-Based Object-Oriented Modeling Languages and Tools, EOOLT '19*, New York, NY, USA. Association for Computing Machinery. <http://dx.doi.org/10.1145/3365984.3365990>
- [15] Lennart Ochel, Robert Braun, Bernhard Thiele, Adeel Asghar, Lena Buffoni, Magnus Eek, Peter Fritzson, Dag Fritzson, Sune Horkeby, Robert Hällquist, Åke Kinnander, Arunkumar Palanisamy, Adrian Pop, and Martin Sjölund (2019). OMSimulator – Integrated FMI and TLM-based Co-simulation with Composite Model Editing and SSP. In *Proceedings of the 13th International Modelica Conference*. Modelica Association and Linköping University Electronic Press. <http://dx.doi.org/10.3384/ecp1915769>
- [16] Peter Fritzson, Adrian Pop, Martin Sjölund, and Adeel Asghar. MetaModelica – A Symbolic-Numeric Modelica Language and Comparison to Julia (2019). In *Proceedings of the 13th International Modelica Conference*. Modelica Association and Linköping University Electronic Press. <http://dx.doi.org/10.3384/ecp19157289>
- [17] Bernhard Thiele, Bernt Lie, Martin Sjölund, Adrian Pop, and Peter Fritzson (2019). Controller Design for a Magnetic Levitation Kit using OpenModelica's Integration with the Julia Language. In *Proceedings of the 13th International Modelica Conference*. Modelica Association and Linköping University Electronic Press. <http://dx.doi.org/10.3384/ecp19157303>
- [18] Adrian Pop, Per Östlund, Francesco Casella, Martin Sjölund, and Rüdiger Franke (2019). A New OpenModelica Compiler High Performance Frontend. In *Proceedings of the 13th International Modelica Conference*. Modelica Association and Linköping University Electronic Press. <http://dx.doi.org/10.3384/ecp19157689>
- [19] Pham, T.P., Seneme, O., and Dugard, L. (2019). “Unified Hinf observer for a class of nonlinear Lipschitz systems: application to a real ER automotive suspension”. *IEEE*

*Control Systems Letters*, 3(4), 817-822. The contents of this paper have been presented at 58th IEEE Conference on Decision and Control.

- [20] Pham, T.P., Sename, O., and Dugard, L. (2019). “Unified Hinf observer for a class of nonlinear Lipschitz systems: application to a real ER automotive suspension”, *In Proceedings of the 58th IEEE Conference on Decision and Control*, Nice, France, December 2019.
- [21] Pham, T.P., Sename, O., and Dugard, L. (2019). “Real-time Damper Force Estimation of Vehicle Electrorheological Suspension: A NonLinear Parameter Varying Approach”, *In proceedings of the 3rd IFAC Workshop on Linear Parameter-Varying Systems*, Eindhoven, Netherlands, November 2019.
- [22] Göttlich, Philipp, and Hans-Christian Reuss. "Functionality and Safety Weaknesses in Integration of Physics-Based Models on Critical Embedded Systems." *In 2019 IEEE International Symposium on Software Reliability Engineering Workshops (ISSREW)*, pp. 67-72. IEEE, Oct. 2019.
- [23] Pham, T.P., Sename, O., Dugard, L. and Vu, V.T.(2019). “LPV force observer design and experimental validation from a dynamical semi-active ER damper model”, *In Proceedings of the 7th IFAC Symposium on Systems Structure and Control*, Sinaia, Romania, September 2019.
- [24] Pham, T.P., Sename, O. and Dugard, L. (2019). “Comparative study of three robust observers for automotive damper force estimation”, *In Proceedings of the 8th International Conference on Mechatronics and Control Engineering*, Paris, France , July 2019.
- [25] Pham, T.P., Sename, O. and Dugard, L. (2019). “Real-time Estimation of Damping Force of Vehicle Electrorheological Suspension System: a new H1 approach and experimental validation”, *In Proceedings of the 9th IFAC International Symposium on Advances in Automotive Control*, Orleans, France , June 2019.
- [26] Manh-Hung Do, Damien Koenig, and Didier Theilliol (2019). “Robust H2 observer design for actuator degradation: Application to suspension system.” *In 2019 4th Conference on Control and Fault-Tolerant Systems (SysTol)*. IEEE. DOI:10.1109/SYSTOL.2019.8864738.
- [27] K. M. M. Rathai, O. Sename and M. Alamir, (2019) “GPU-Based Parameterized NMPC Scheme for Control of Half Car Vehicle With Semi-Active Suspension System”, *in IEEE Control Systems Letters*, vol. 3, no. 3, pp. 631-636, July 2019. doi: 10.1109/LCSYS.2019.2915002
- [28] K. M. Madhavan Rathai, O. Sename and M. Alamir, (2019) “Reachability based Model Predictive Control for Semi-active Suspension System”, *2019 Fifth Indian Control Conference (ICC), New Delhi, India, 2019*, pp. 68-73. doi: 10.1109/INDIANCC.2019.8715601 ( hal-01882534 )
- [29] Murali Madhavan Rathai, Karthik, Mazen Alamir, and Olivier Sename. 2019. “Experimental Implementation of Model Predictive Control Scheme for Control of Semi-Active Suspension System.” *In 9th IFAC International Symposium on Advances in Automotive Control*. Orleans, France. <https://hal.archives-ouvertes.fr/hal-02160145>.

- [30] Brembeck, Jonathan. 2019. "Nonlinear Constrained Moving Horizon Estimation Applied to Vehicle Position Estimation." *Sensors* 19 (10): 2276. doi:10.3390/s19102276. <https://www.mdpi.com/1424-8220/19/10/2276>.
- [31] Lenord, Oliver. 2019. "Standardizing eFMI for Embedded Systems with Physical Models in the Production Code Software." presented at the Jubilee Symposium: Future Directions of System Modeling and Simulation, Medicon Village, Lund, Sweden, September 30. <https://modelica.github.io/Symposium2019/>.
- [32] Brembeck, J. A Physical Model-Based Observer Framework for Nonlinear Constrained State Estimation Applied to Battery State Estimation. *Sensors* **2019**, *19*, 4402. doi: 10.3390/s19204402. <https://www.mdpi.com/1424-8220/19/20/4402>
- [33] Bürger, Christoff. 2019. "Modelica language extensions for practical non-monotonic modelling: on the need for selective model extension" In *Proceedings of the 13th International Modelica Conference*. Regensburg, Germany. doi: 10.3384/ecp19157. <https://www.modelica.org/events/modelica2019/proceedings/html>.
- [34] Bert Van Acker, Paul De Meulenaere, Joachim Denil, Yuri Durodie, Alexander Van Bellinghen, Kris Vanstechelma (2019). "Valid (re-) use of models-of-the-physics in cyber-physical systems using validity frames". In 2019 Spring Simulation Conference (SpringSim), Tucson, AZ, USA

## 2018

- [35] Pham, T.P., Sename, O., Dugard, L. and Vu, V.T.(2018). "Real-time Estimation of the Damping Force of Vehicle Electrorheological Suspension", In *Proceedings of the 16th International Conference on Vehicle System Dynamics, Identification and Anomalies*, Budapest, Hungary , November 2018.
- [36] Karthik Murali Madhavan Rathai, Olivier Sename, Mazen Alamir. "A comparative study of different NMPC schemes for control of semi-active suspension system". *VSDIA 2018 - The 16th Mini Conference on Vehicle System Dynamics, Identification and Anomalies, Nov 2018, Budapest, Hungary*. { hal-01994573 }
- [37] Karthik Murali Madhavan Rathai, Mazen Alamir, Olivier Sename, Rattena Tang. "A Parameterized NMPC Scheme for Embedded Control of Semi-active Suspension System." *6th IFAC Conference on Nonlinear Model Predictive Control NMPC 2018, Aug 2018, Madison, Wisconsin, United States*. pp.301-306, { 10.1016/j.ifacol.2018.11.029 }. { hal-01955033 }
- [38] Manh-Hung Do, Damien Koenig, and Didier Theilliol (2018). "An integrated design for robust actuator fault accommodation based on H-infinity proportional-integral observer." In *2018 57th IEEE Conference on Decision and Control (CDC)*, 6346-6352. IEEE.
- [39] Manh-Hung Do, Damien Koenig, and Didier Theilliol (2018). "Robust H-infinity proportional-integral observer for fault diagnosis: Application to vehicle suspension." In *2018 10th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes (SAFEPROCESS)*, IFAC-PapersOnLine, 51(24), 536-543.

- [40] Lenord, Oliver, Fabian Jarmolowitz, Wolfgang Kiesenhofer, Katharina Rath, and Thomas Obertopp. 2018. “Towards an Integrated Tool Chain from Physical Models to Diagnosis Functions.” In *Proceedings of the 12th MODPROD Workshop 2018 on Cyber-Physical Systems of Systems*. Linköping, Sweden.  
[https://flumes.iei.liu.se/modprod/modprod2018\\_proceedings/modprod18\\_talk4b-Lenord\\_Tool-Chain-Modelbased-Diagnosis.pdf](https://flumes.iei.liu.se/modprod/modprod2018_proceedings/modprod18_talk4b-Lenord_Tool-Chain-Modelbased-Diagnosis.pdf).

## 2017 and before

- [41] Neudorfer, Jonathan, Siva Sankar Armugham, Mathews Peter, Naresh Mandipalli, Oliver Lenord, Christian Bertsch, Arndt-Michael Meyer, and Markus Behle. 2017. “Towards an Integrated Tool Chain from Physical Modeling to ECU Software Using FMI on AUTOSAR Platforms.” In *Proceedings of the 11th MODPROD Workshop 2017 on Model-Based Product Development and Internet-of-Things*. Linköping, Sweden.  
[https://flumes.iei.liu.se/modprod/modprod2017\\_proceedings/modprod2017-day1-talk04-OliverLenord-From-Physical-Modeling-to-ECU.pdf](https://flumes.iei.liu.se/modprod/modprod2017_proceedings/modprod2017-day1-talk04-OliverLenord-From-Physical-Modeling-to-ECU.pdf).
- [42] Ahle, Elmar, Christian Bertsch, Jonathan Neudorfer, Siva Sankar Arumugham, Karthikeyan Ramachandran, and Andreas Thuy. 2015. “FMI for Physical Models on Automotive Embedded Targets.” In , 43–50. doi:10.3384/ecp1511843.

## Other Disseminations

Presentations at marketing events, customer presentations, other related promotions,...

### 2019

- [43] Lenord, Oliver. 2019. “EMPHYSIS – FMI for Embedded Systems.” presented at the AE2 Colloquium: Software-Intensive Systems & Technologies, Renningen, Germany, April 30.

### 2017 – 2020

- [44] P Chombart (Dassault Systemes) : EMPHYSIS project DS internal promotion has been done in our Dassault Systemes internal CATIA community (several hundreds of members) . 7 posts published to relate the progress of EMPHYSIS, from 2017 to 2020 .