ModelWriter

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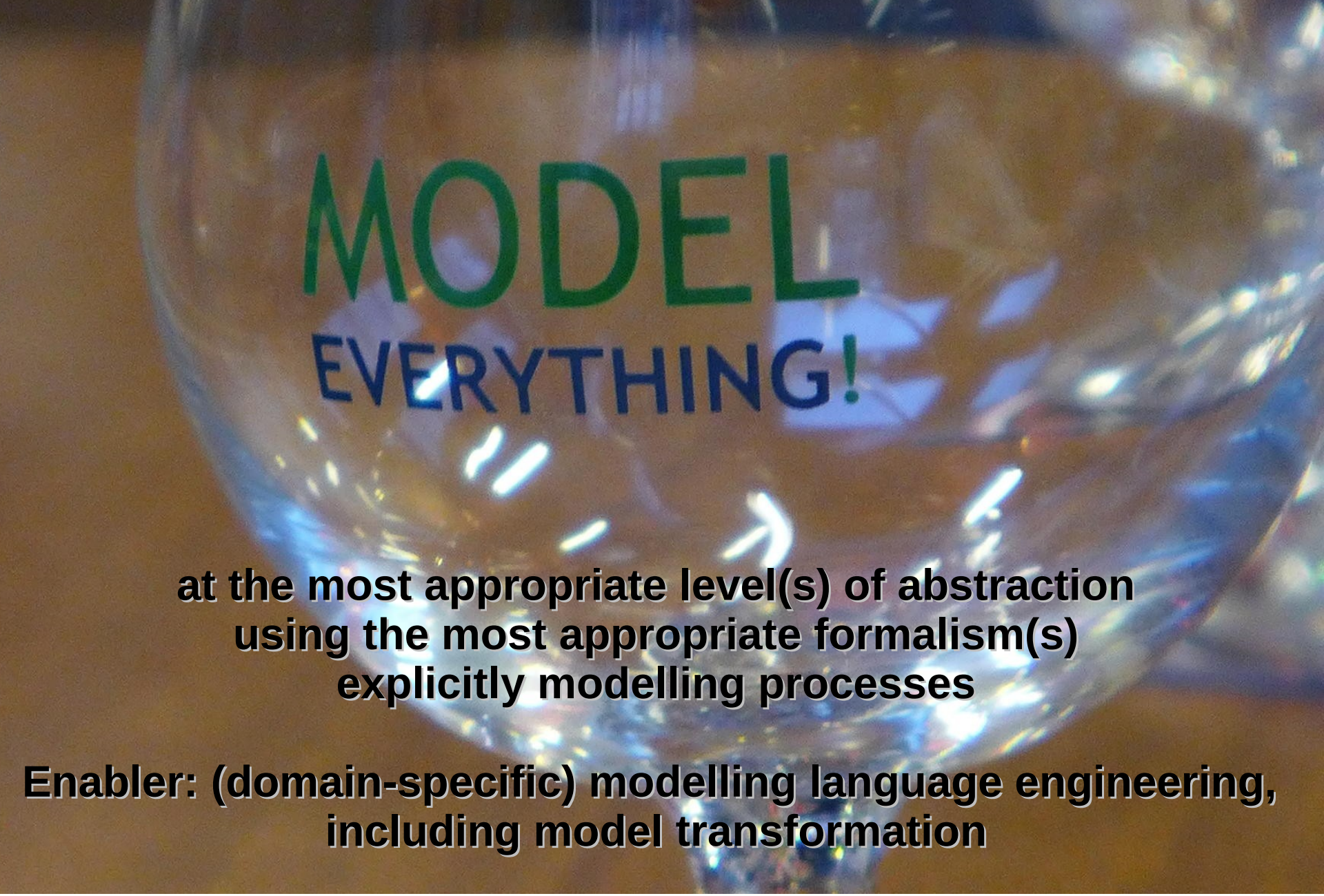
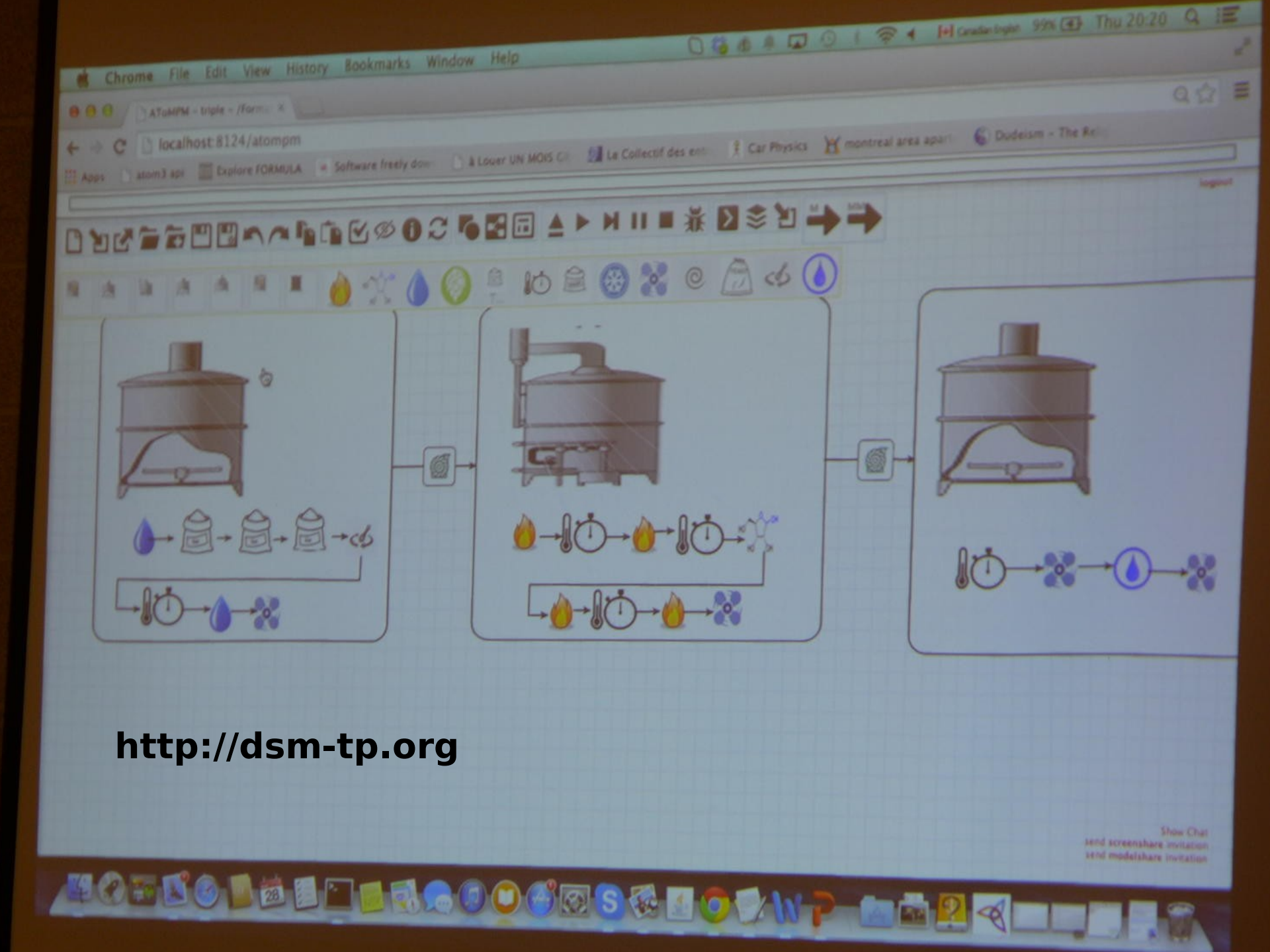
30-04-15 @ Sogeti



at the most appropriate level(s) of abstraction
using the most appropriate formalism(s)
explicitly modelling processes

Enabler: (domain-specific) modelling language engineering, including model transformation

Pieter J. Mosterman and Hans Vangheluwe. Computer Automated Multi-Paradigm Modeling: An Introduction. Simulation: Transactions of the Society for Modeling and Simulation International , 80(9):433- 450, September 2004. Special Issue: Grand Challenges for Modeling and Simulation.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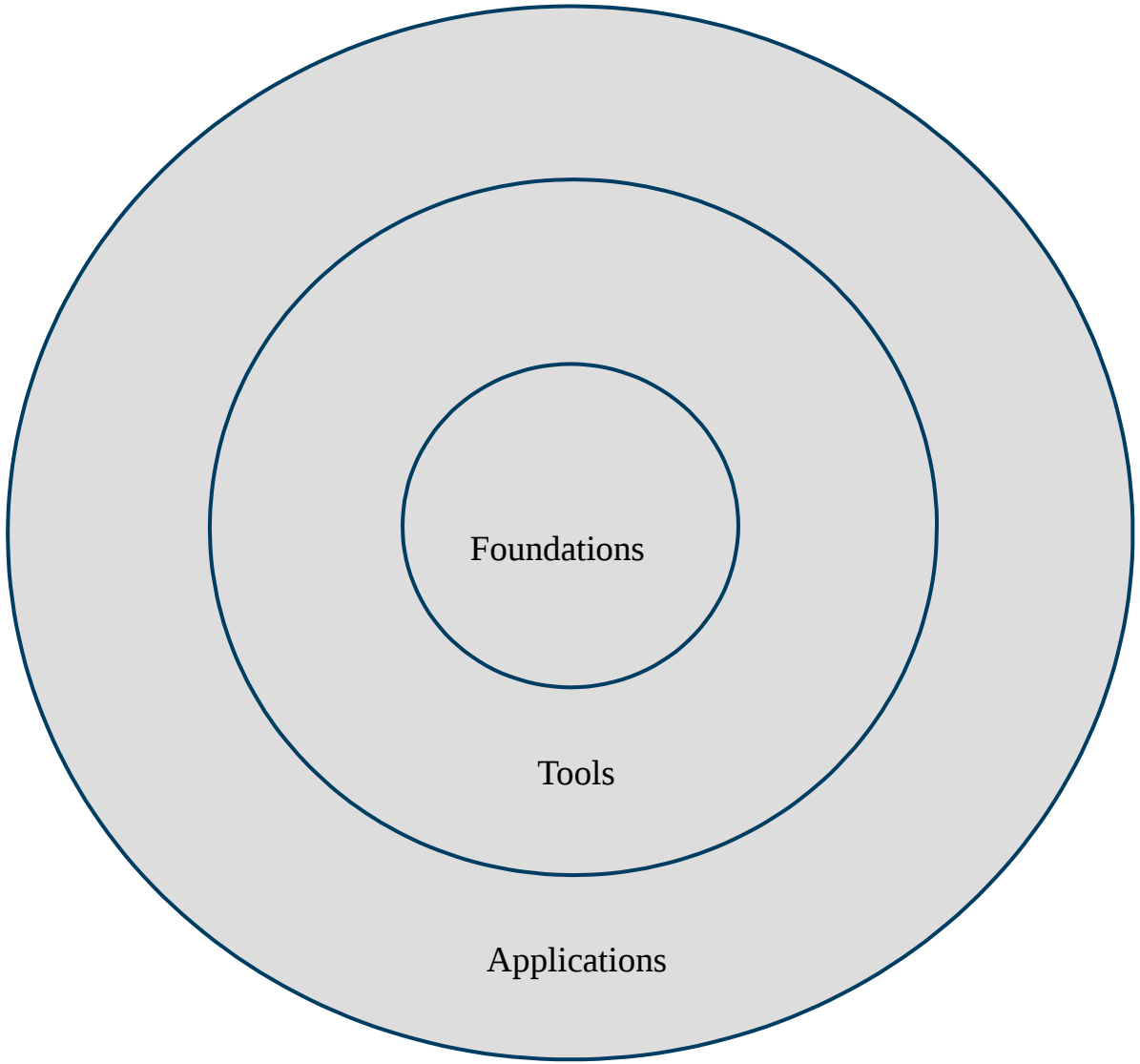

Foundations
Tools
Applications

Foundations

Validation, Verification, Testing and Accreditation

Analysis and Verification of Model Transformations, Debugging, Instrumentation, Tracing, etc.

Language Engineering

Domain-Specific Languages, Model Transformation, (web-based) Visual and Textual Modelling Environments, etc.

Simulation

Co-Simulation, Discrete-event, DEVS, continuous time, acausal, Modelica, etc.

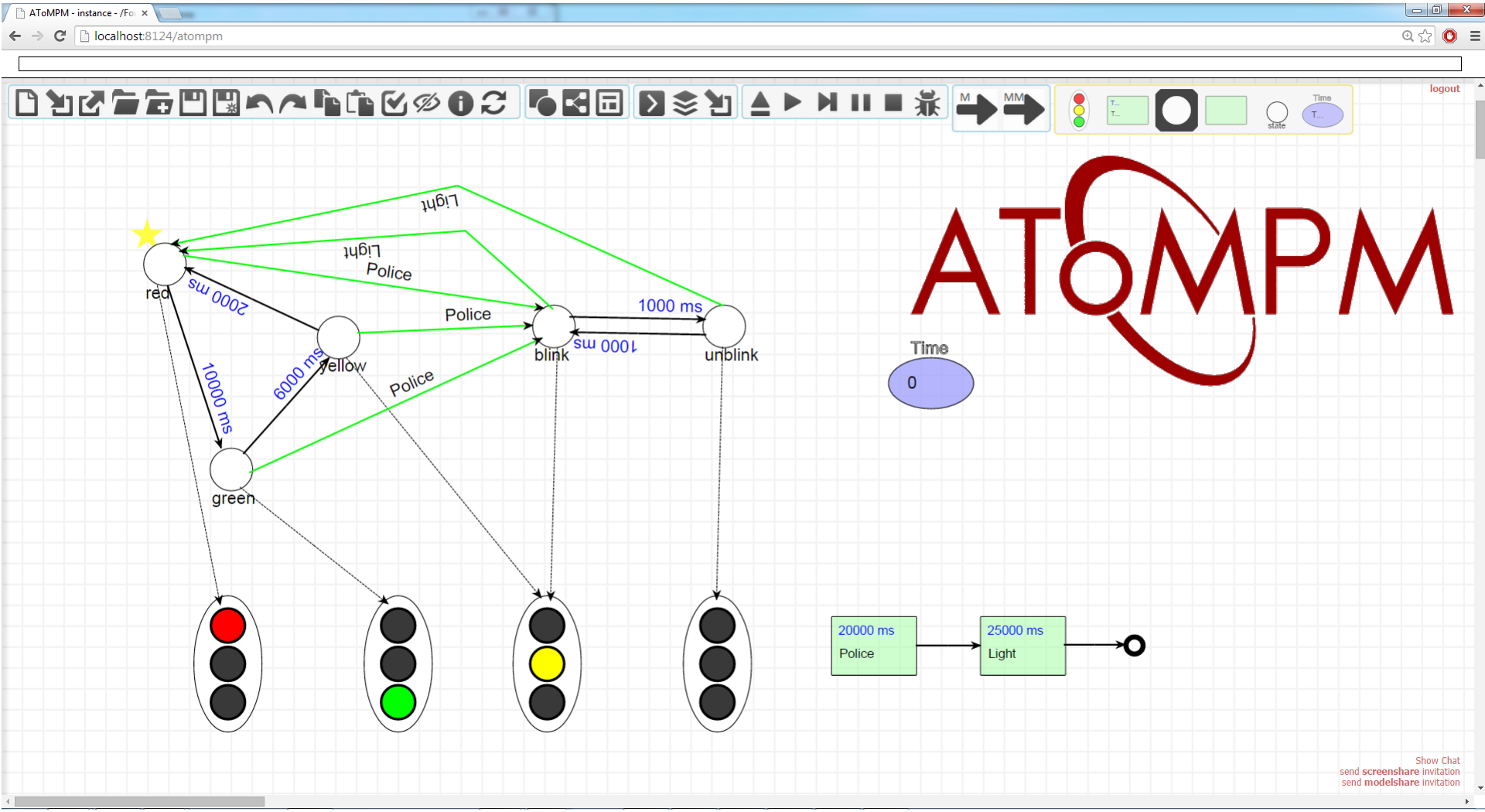
Deployment & Resource-optimized Execution

Platforms (e.g. AUTOSAR, CAN, etc.), Design-Space Exploration, Virtualization, Models@run-time, Efficient execution of model transformations, etc.

Model Management & Process

FTG+PM, Safety (ISO 26262, Railway, etc,), Agile Modelling, Consistency management, Experimental frames, etc.

(domain-specific) Modelling Language Engineering – modelled UI

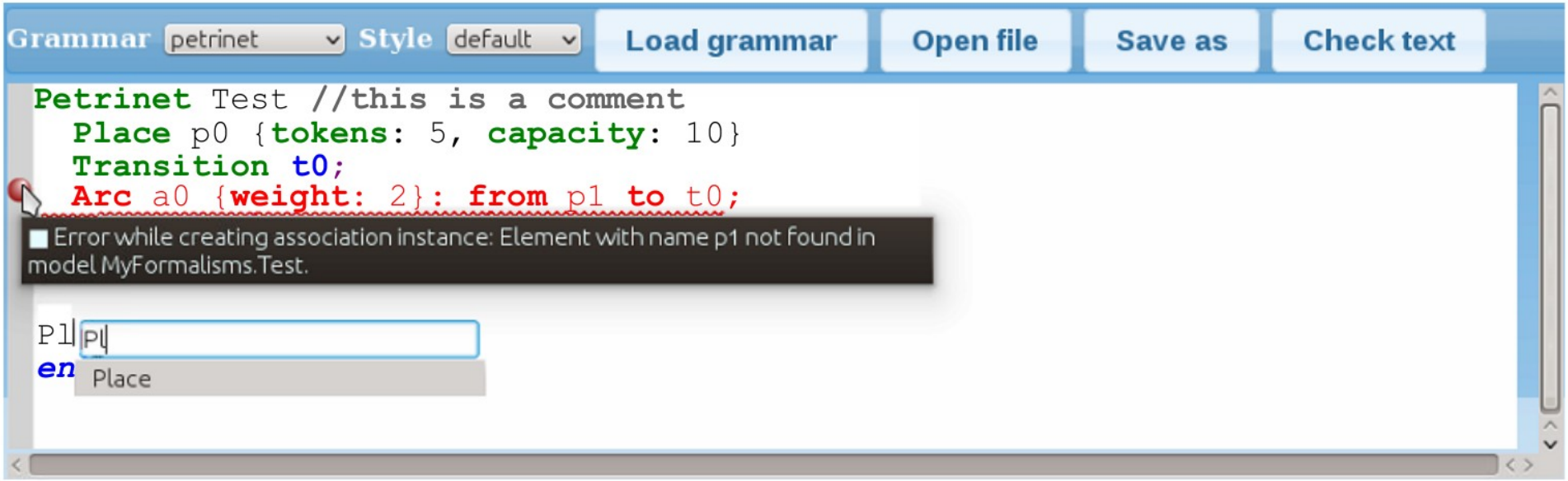


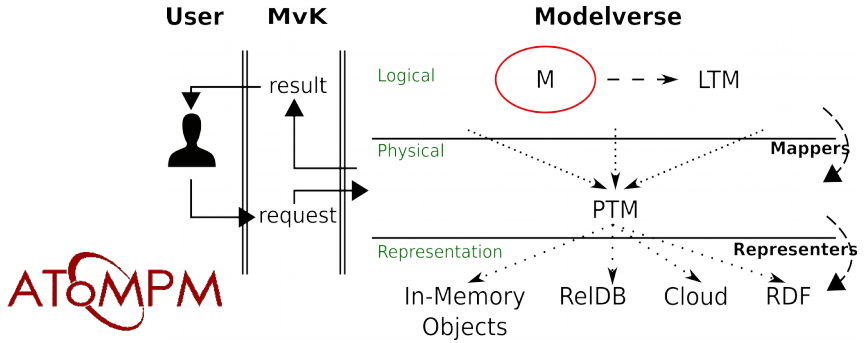
Raphael Mannadiar. A Multi-Paradigm Modelling Approach to the Foundations of Domain-Specific Modelling. PhD thesis, McGill Univ., 2012.

Eugene Syriani, Hans Vangheluwe, Raphael Mannadiar, Conner Hansen, Simon Van Mierlo, and Huseyin Ergin. AToMPM: A web-based modeling environment. In Proceedings of MODELS'13 Demonstration Session co-located with the 16th International Conference on Model Driven Engineering Languages and Systems (MODELS 2013), Miami, USA, pages 21- 25, 2013.

https://www.youtube.com/watch?feature=player_detailpage&v=RYtea2BiQ98

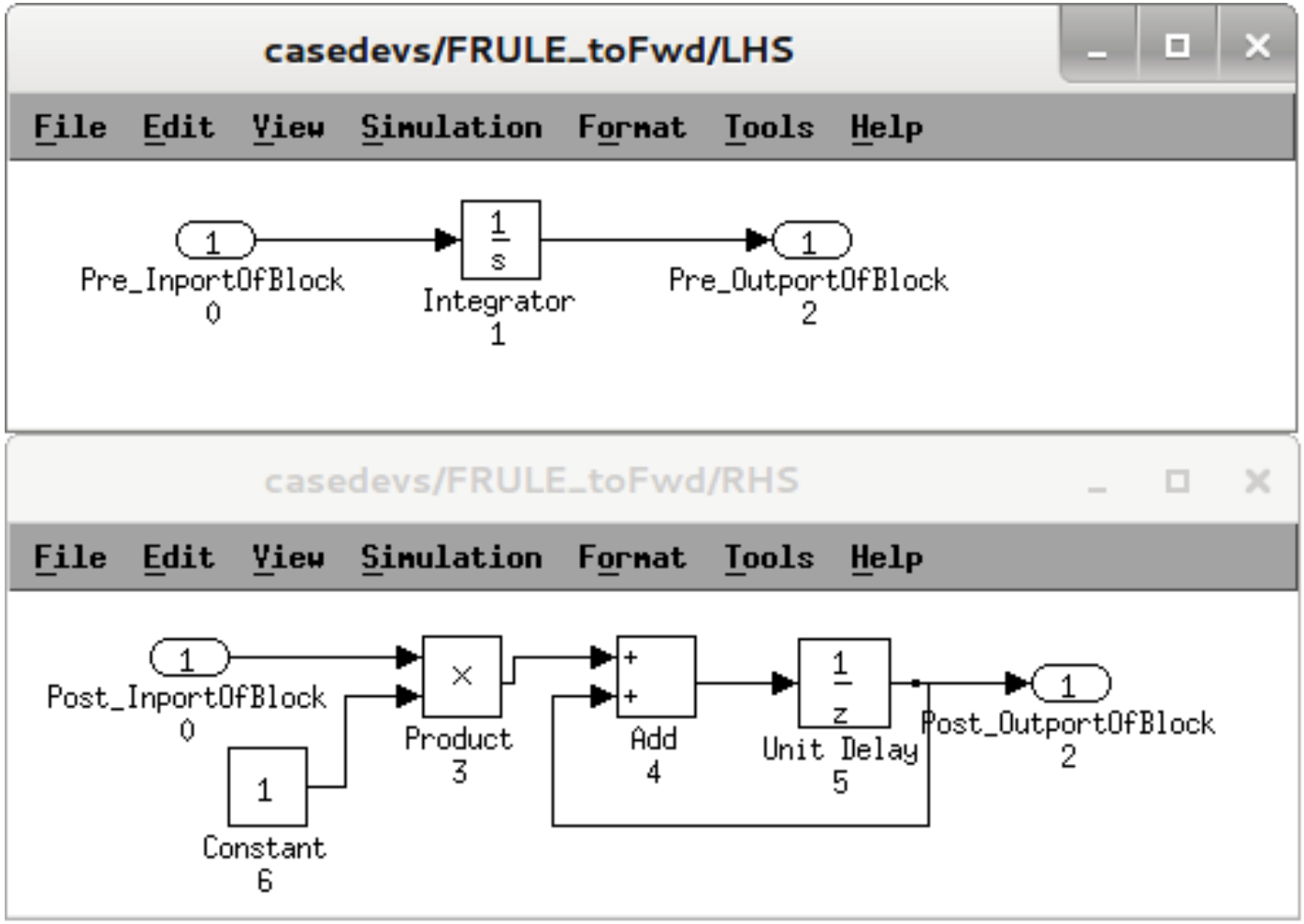
(domain-specific) Modelling Language Engineering – modelled UI





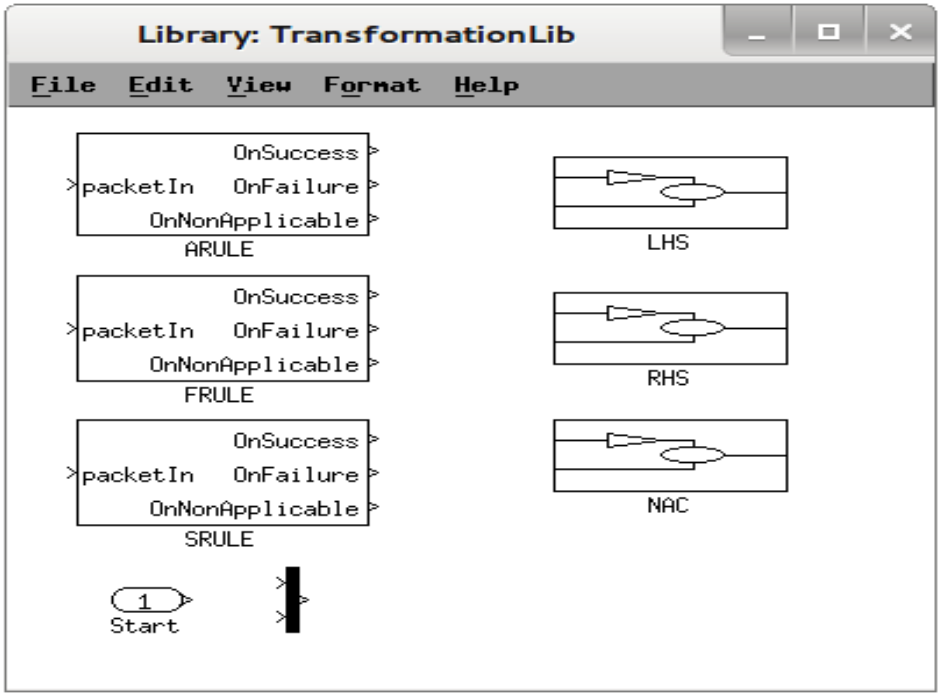
Simon Van Mierlo, Bruno Barroca, Hans Vangheluwe, Eugene Syriani, and Thomas Kuehne. Multi-level modelling in the Modelverse. In The first Workshop on Multi-Level Modelling (MULTI), co-located with the 17th International Conference on Model Driven Engineering Languages and Systems (MoDELS), Valencia, Spain, volume 1286 of CEUR Workshop Proceedings , pages 83 - 92, 2014.

Transformations: Rule

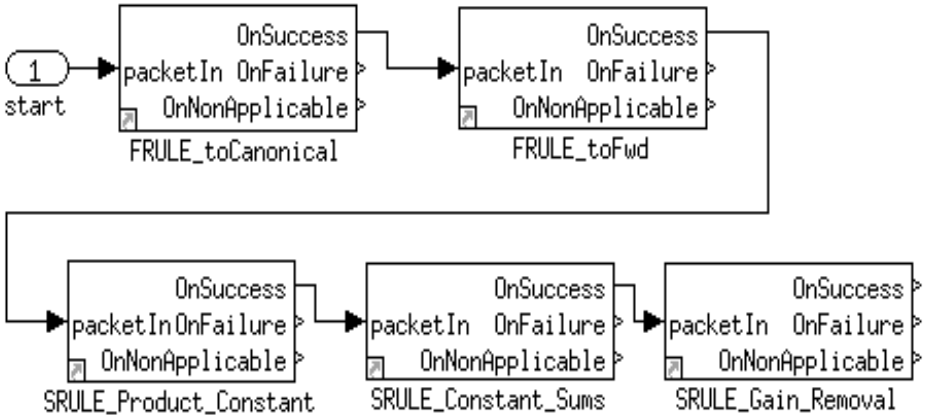


Joachim Denil, Pieter J. Mosterman, and Hans Vangheluwe. Rule-Based Model Transformation For, and In Simulink. In Proceedings of the Spring Simulation Multi-Conference, pages 314 - 321. SCS, April 2014. Overall best paper award of the SpringSim multi-conference .

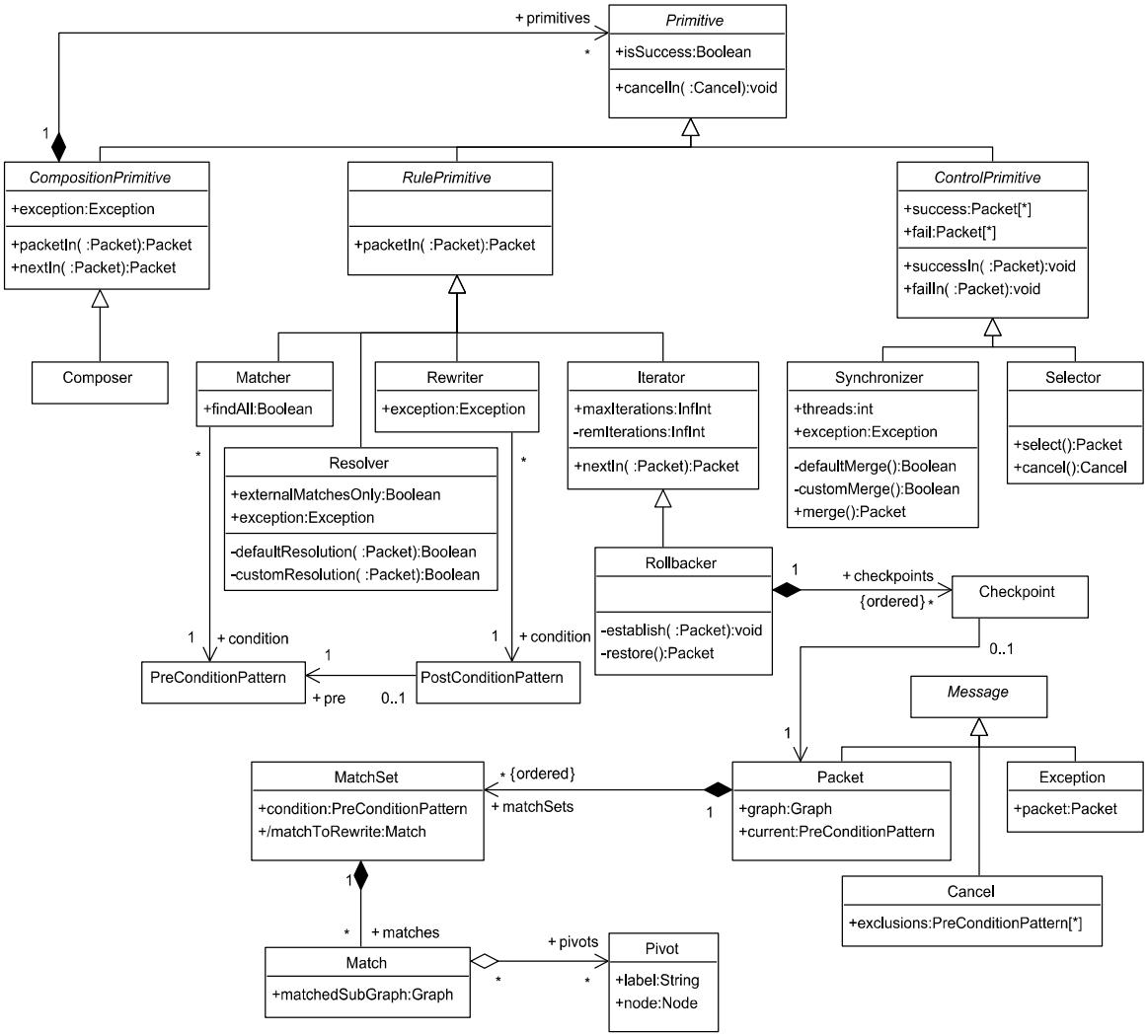
Transformation Rules



Transformation Schedule



T-Core



Eugene Syriani, Hans Vangheluwe, and Brian LaShomb. T-core: A framework for custom-built transformation languages. Software and Systems Modeling (SoSyM), pages 1 - 29, 2013. Published online DOI 10.1007/s10270-013-0370-4.

Model Transformation Analysis

Moussa Amrani, Levi Lucio, Gehan M. K. Selim, Benoit Combemale, Juergen Dingel, Hans Vangheluwe, Yves Le Traon, and James R. Cordy. A tridimensional approach for studying the formal verication of model transformations. In IEEE International Conference on Software Testing, Verification and Validation (ICST), pages 921 - 928, 2012.

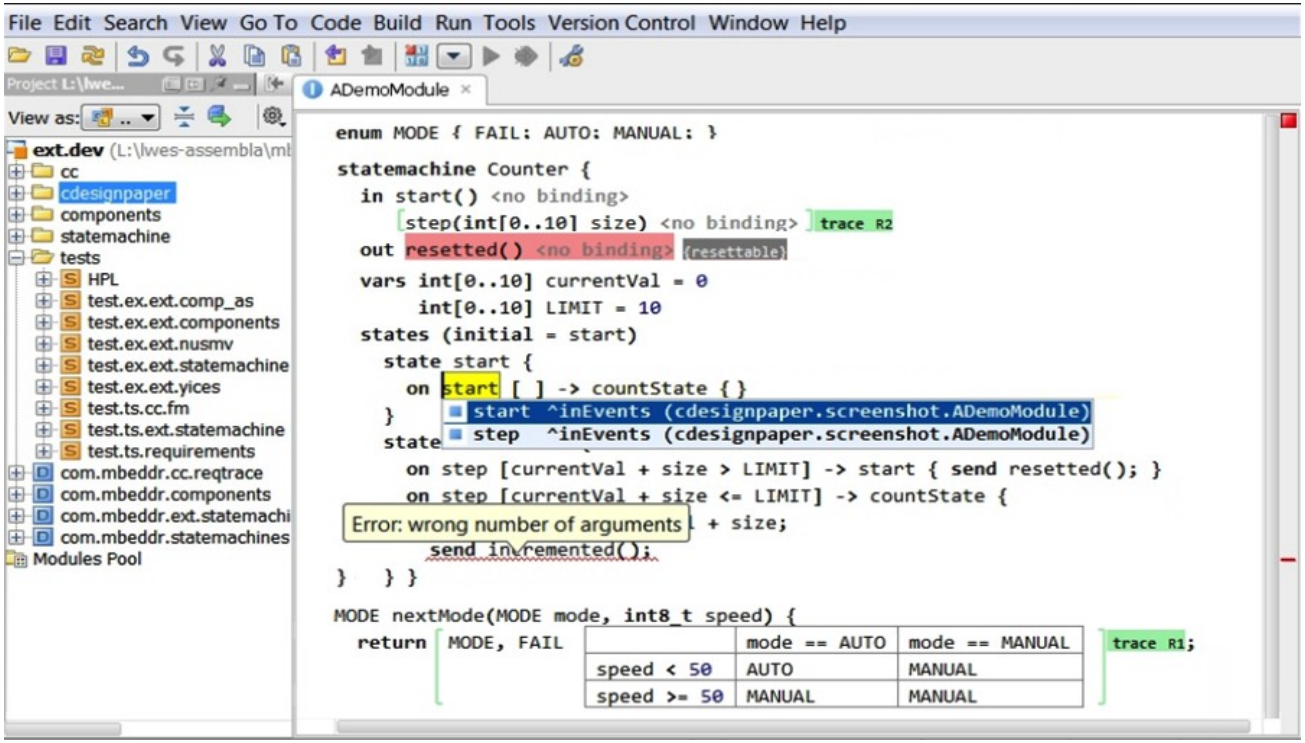
- # GM 2 Autosar (Model 2 Model)

Gehan M. K. Selim, Levi Lucio, James R. Cordy, Jürgen Dingel, Bentley J. Oakes: Specification and Verification of Graph-Based Model Transformation Properties. ICGT 2014: 113-129.
Levi Lucio, Bentley James Oakes, and Hans Vangheluwe. Symbolic Verification of Translation Model Transformations. Software and Systems Modeling. Under revision 2015.

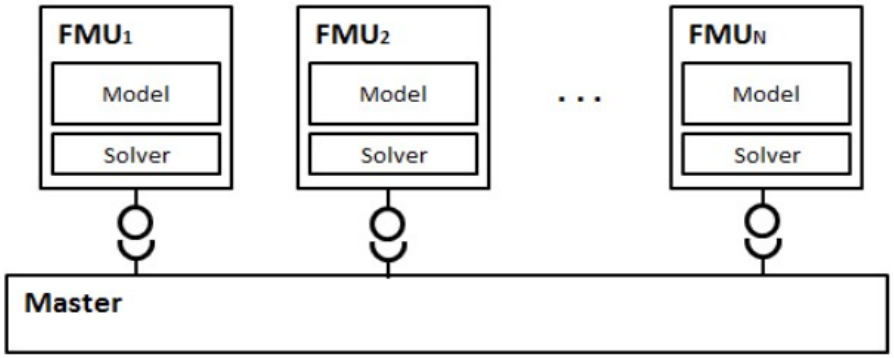
- mbeddr engineering the future of embedded software

(Model 2 Text)

With Markus Voelter

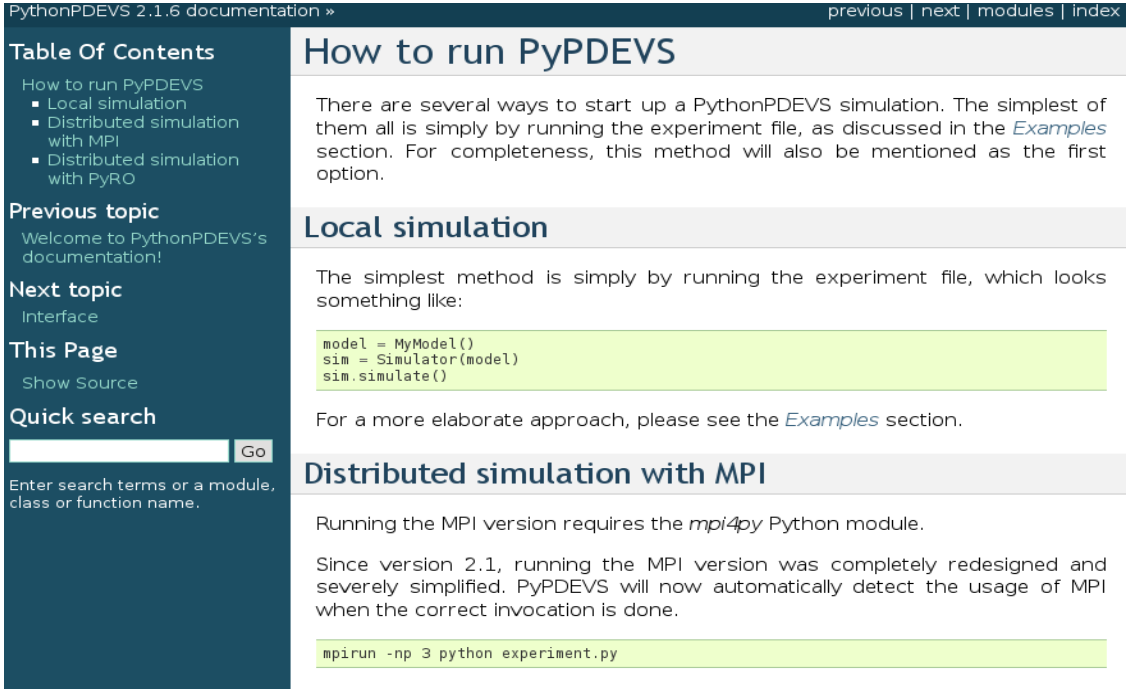


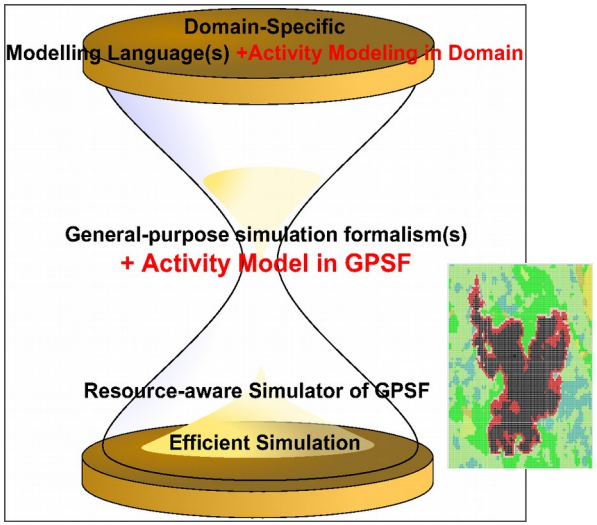
Simulation



Joachim Denil, Bart Meyers, Paul De Meulenaere, and Hans Vangheluwe. Explicit semantic adaptation of hybrid formalisms for FMI co-simulation. In Proceedings of the 2015 Spring Simulation Multi-Conference, pages 852 - 859. SCS, April 2015.

Bert Van Acker, Joachim Denil, Hans Vangheluwe, and Paul De Meulenaere. Generation of an optimised master algorithm for FMI co-simulation. In Proceedings of the 2015 S Spring Simulation Multi-Conference, pages 946 - 953. SCS, April 2015.

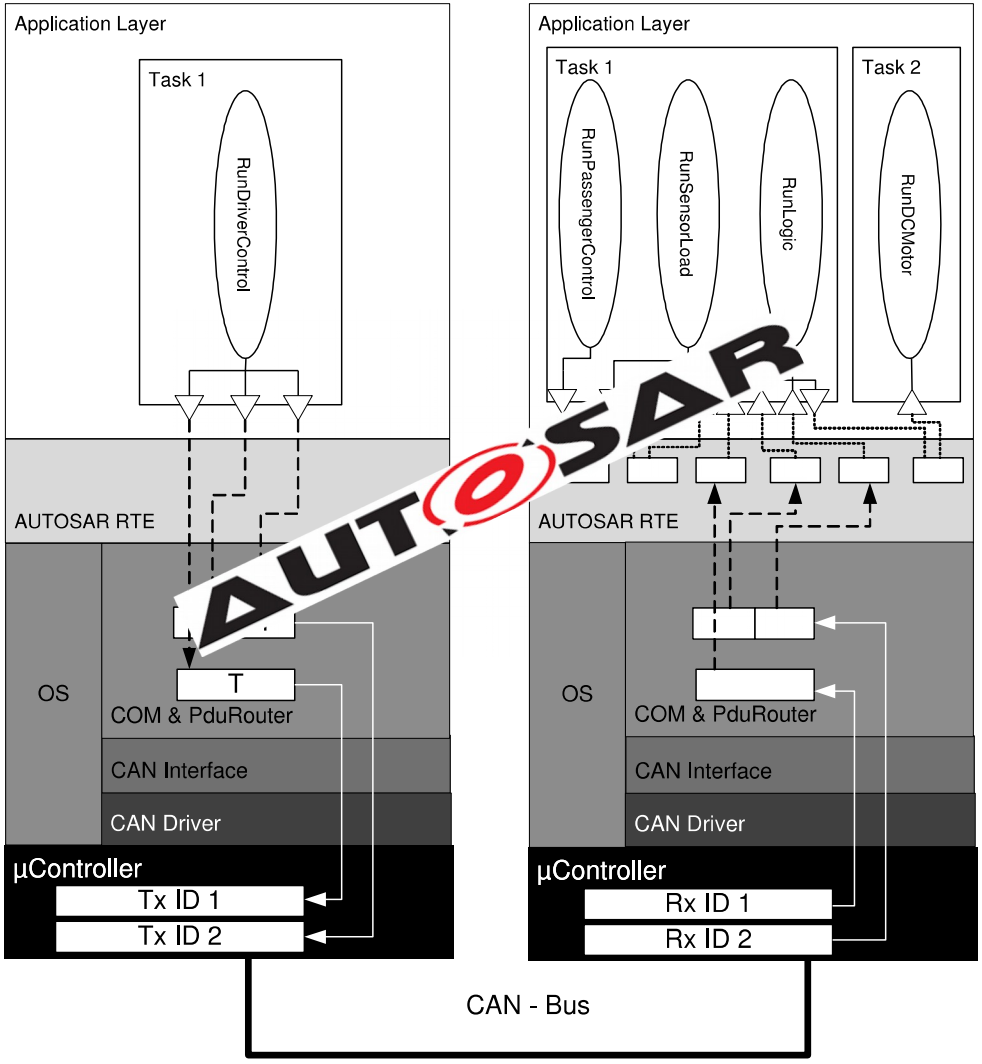




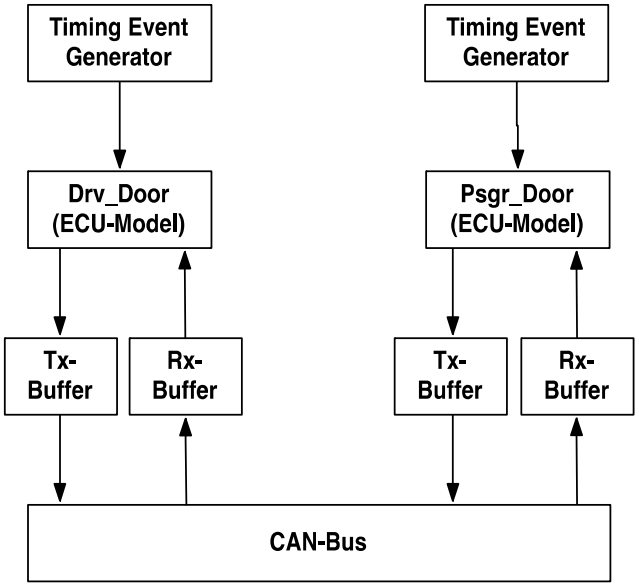
Yentl Van Tendeloo and Hans Vangheluwe. PythonPDEVS: A distributed Parallel DEVS simulator. In Proceedings of the 2015 Spring Simulation Multi-Conference, pages 844 - 851. SCS, April 2015.

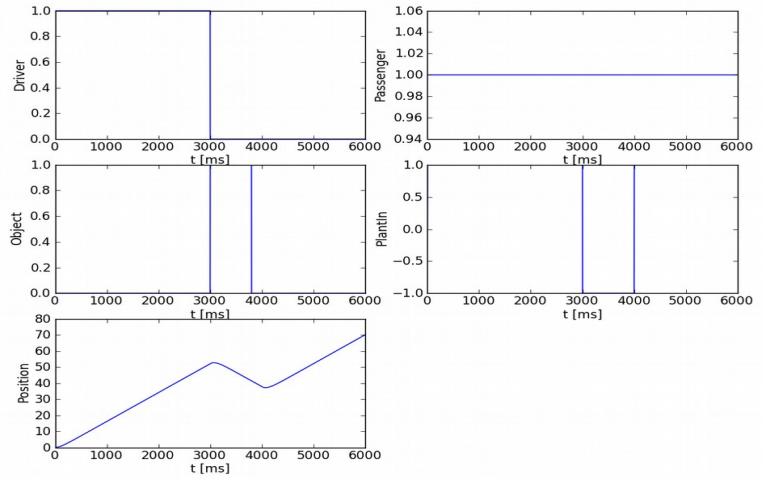
Yentl Van Tendeloo and Hans Vangheluwe. Activity in PythonPDEVS. ITM Web of Conferences , 3(01002):10, December 2014. Published online DOI 10.1051/itmconf/20140301002.

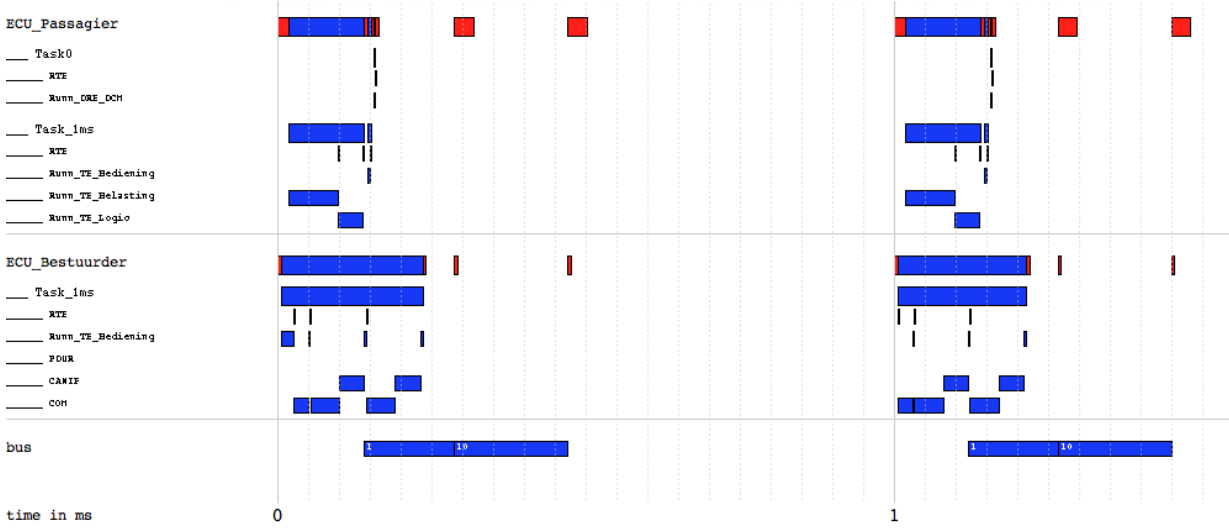
Deployment and Resource-Optimized Execution



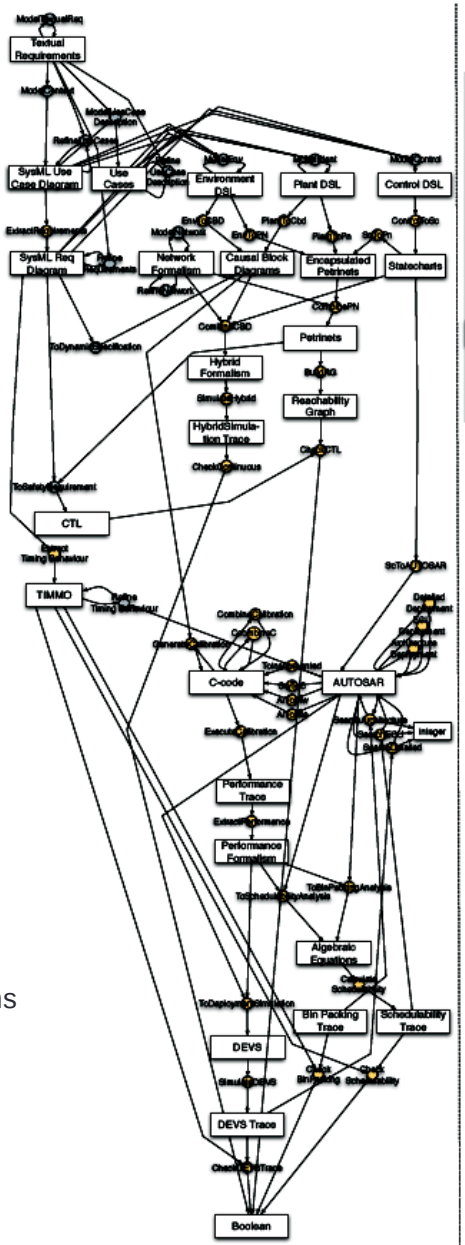
Deployment/Design-Space Exploration (trsf. To MILP, trsf. based)

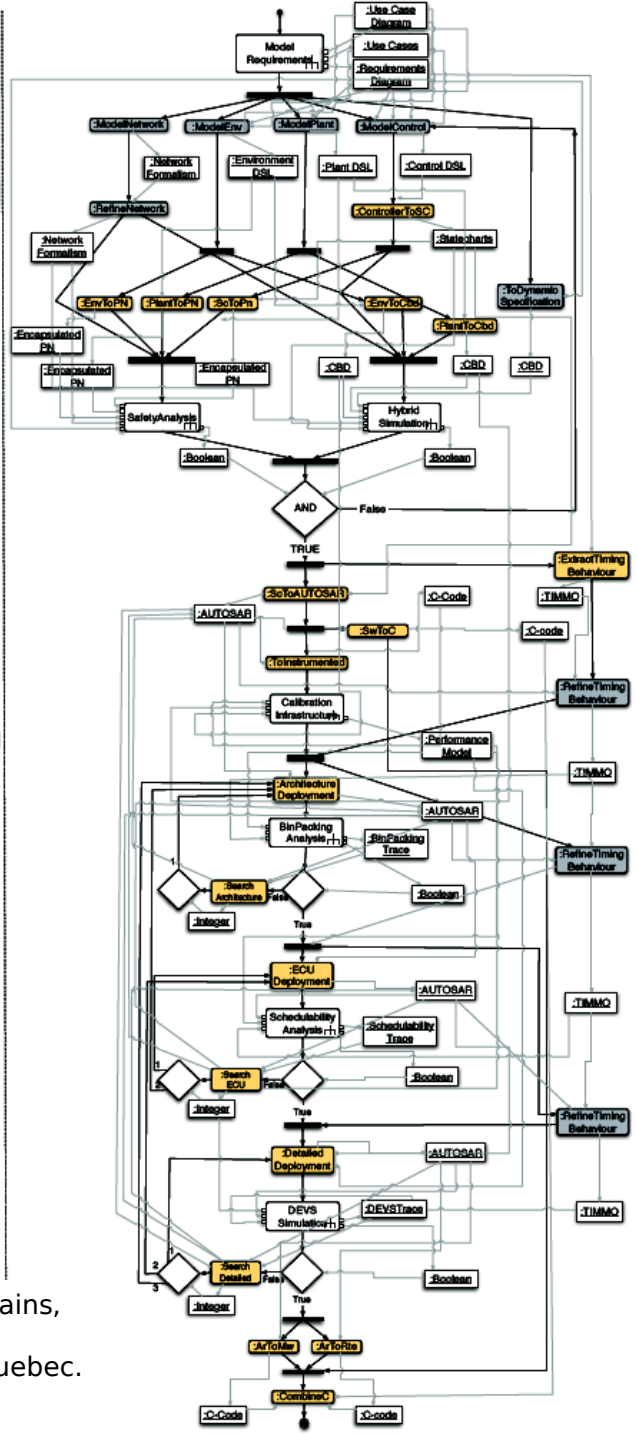






Joachim Denil, Hans Vangheluwe, Pieter Ramaekers, Paul De Meulenaere, and Serge Demeyer. DEVS for AUTOSAR platform modelling. In Spring Simulation Multiconference , pages 67 - 74. Society for Computer Simulation International (SCS), April 2011. Boston, MA, USA.



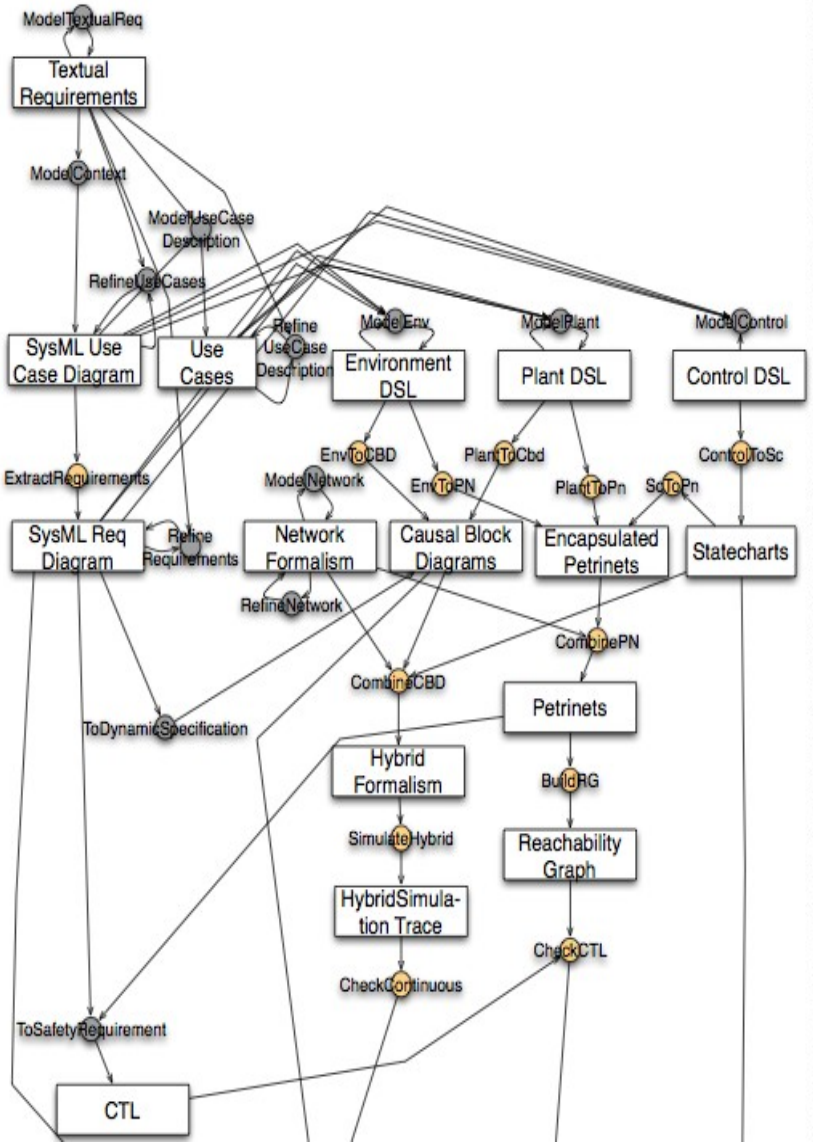


28 different modelling formalisms

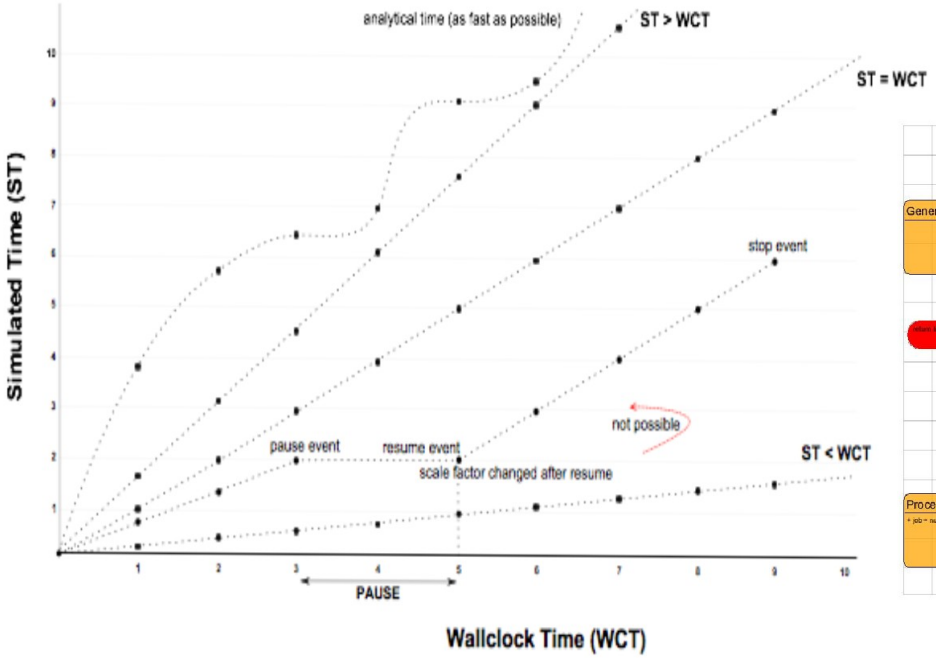
50 transformations

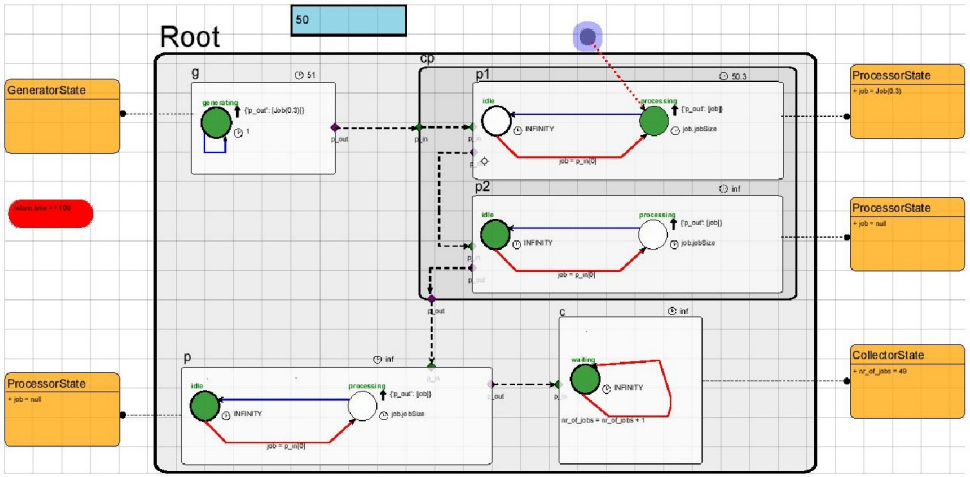
FTG+PM: An Integrated Framework for Investigating Model Transformation Chains, Levi Lúcio, Sadaf Mustafiz, Joachim Denil, Hans Vangheluwe, Maris Jukss. Proceedings of the System Design Languages Forum (SDL) 2013, Montreal, Quebec. Lecture Notes in Computer Science (LNCS), Volume 7916, pp 182-202, 2013.

FTG+PM (model mgmt. … **consistency**)



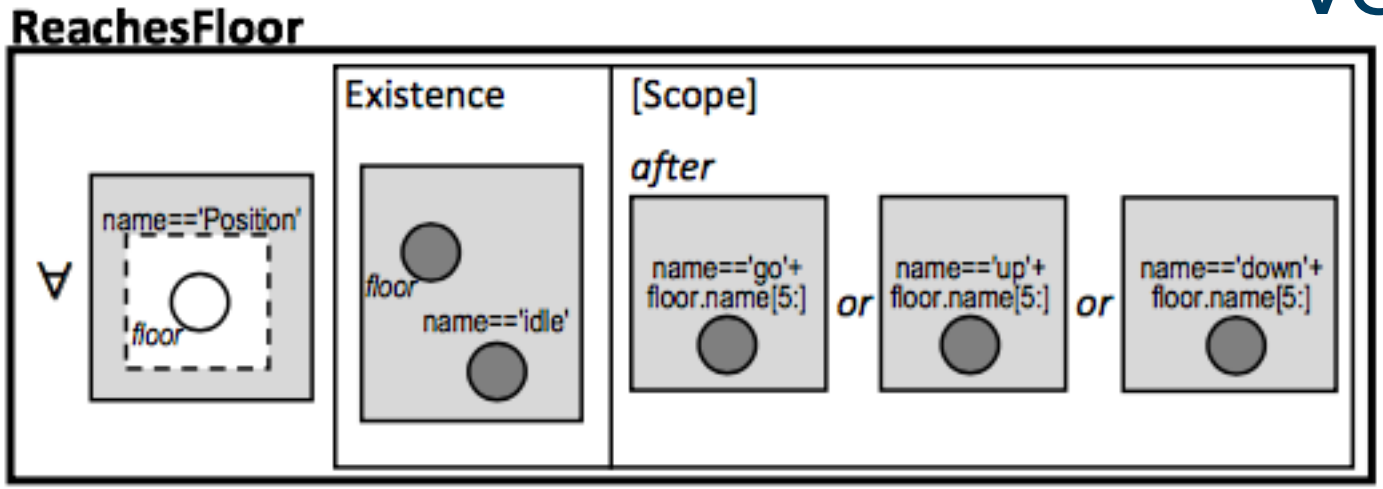
Debugging





Simon Van Mierlo, Yentl Van Tendeloo, Sadaf Mustaz, Bruno Barroca, and Hans Vangheluwe. Explicit modelling of a Parallel DEVS experimentation environment. In Spring Simulation Multi-Conference, pages 860 - 867. SCSI, April 2015.

Verification



Bart Meyers, Romuald Deshayes, Levi Lucio, Eugene Syriani, Hans Vangheluwe, and Manuel Wimmer. ProMoBox: A Framework for Generating Domain-Specic Property Languages. In Software Language Engineering (SLE), Vasteras, Sweden, volume 8706 of Lecture Notes in Computer Science (LNCS) , pages 1- 20. Springer. September 2014.

some relevant Projects

http://www.mbse4mechatronics.org/

MPM4CPS

http://www.cost.eu/COST_Actions/ict/Actions/IC1404

http://www.necsis.ca/

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