5th Annual OpenModelica Workshop
Feb 4, 2013

Workshop Opening

OpenModelica – Status and Directions

Peter Fritzson
To All Participants!

Very Welcome to this Fifth Annual OpenModelica Workshop!
Important Goal Achieved During 2012
MSL 3.2.1 Coverage > 90%, including most of Fluid
Goals for the OpenModelica Effort

• Comprehensive **modeling, simulation and systems engineering** environment for research, teaching, and industrial usage

• **Open-source** for both **industrial** and **academic** usage

• Invitation for **open-source cooperation** around OpenModelica, tools, and applications
Updated OpenModelica Web Page

OpenModelica

Introduction

OPENMODELICA is an open-source Modelica-based modeling and simulation environment intended for industrial and academic usage. Its long-term development is supported by a non-profit organization – the Open Source Modelica Consortium (OSMC).

The goal with the OpenModelica effort is to create a comprehensive Open Source Modelica modeling, compilation and simulation environment based on free software distributed in binary and source code form for research, teaching, and industrial usage. We invite researchers and students, or any interested developer to participate in the project and cooperate around OpenModelica, tools, and applications.

Top information

OMEdit
Enhanced OpenModelica Connection Editor.

OMPython
The new OpenModelica Python interface.

Modelica/OpenModelica Videos

Watch the Modelica/OpenModelica Videos here.

Registration

Please register if you download and install OpenModelica. Why? We would like to inform you about new releases of OpenModelica! We want be informed who is using it and the kind of usage. Your information will not be distributed to third party.

Register yourself to get information about new releases. Participate in the OpenModelica Interest mailing list.

Latest news

- February 1: OpenModelica 1.9.0 Beta4 released
- October 19: OpenModelica 1.9.0 Beta2 released
- Oct 16: CFP OpenModelica/MODPROD Workshops February 2013
- August 31: OpenModelica 1.9.0 Beta released
- April 4: OpenModelica 1.8.1 released
- Jan 30: OpenModelica 1.8.1 beta released
- January 22: Registration Open - MODPROD 2012 and OpenModelica 2012 workshops on Model-based development
- Nov 25: OpenModelica 1.8.0 released
- Nov 22: Preliminary Program For OpenModelica Annual Workshop
- OpenModelica Developers Week - 7-11 November 2011
The OpenModelica Open Source Environment
www.openmodelica.org

- Advanced Interactive Modelica compiler (OMC)
  - Supports most of the Modelica Language
  - Modelica and Python scripting
- Basic environment for creating models
  - OMShell – an interactive command handler
  - OMNotebook – a literate programming notebook
  - MDT – an advanced textual environment in Eclipse

- OMEdit graphic Editor
- OMOptim optimization tool
- ModelicaML UML Profile
- MetaModelica extension
- ParModelica extension

www.openmodelica.org
Main Events 2012 and January 2013

- OSMC expanded from 38 to 45 organizational members
- OpenModelica 1.8.1 release (April 2012)
  - Operator Overloading support
  - Dramatically improved flattening speed for some models
  - Improved simulation run-time
  - ModelicaML with Modelica library import (MSL) and value-bindings
- OpenModelica 1.9.0 beta1 release (August 2012)
  - MSL simulation improved, from 36 to 74 example models
  - Improved simulation of other libraries, e.g. ThermoSysPro, PlanarMechanics, etc.
  - Improved algorithms for tearing, matching, dynamic state selection, index reduction
  - Full version of OMPython, updated ModelicaML for requirements verification
- OpenModelica 1.9.0 beta3/4 release (January 2013)
  - MSL simulation improved, from 74 to 233 example models (92% of MSL 3.2.1)
  - Breakthrough: Flattening of whole Fluid library, simulation of 58% of Fluid examples
  - Improved simulation of other libraries, e.g. ThermoSysPro, PlanarMechanics, etc.
  - Improved algorithms for tearing, matching, dynamic state selection, index reduction
  - Updated version of OMPython supporting new PySimulator release
OpenModelica – Outlook for 2013

• Whole 2013. Continued high priority on better coverage for the Modelica standard libraries, increase from 92% to 100% coverage
• Late spring 2013. Support for larger models with new fast compiler frontend
• Spring 2013 All of Fluid library simulating
• Whole 2013. Improved simulation efficiency.
• May-June 2013. Integrated Modelica debugger.
• Sept 2013. Shifting to bootstrapped OpenModelica compiler for development.
• Fall 2013. Support for Modelica 3.3 clock-based synchronous and state machine features
• Whole 2013. Further improved Parallel Modelica simulation, OpenMP, and ParModelica for GPU simulation prototypes
Further Improved OpenModelica Connection Editor OMEdit

- Supports MSL 3.2.1
- Easy to use
- Stable
- Implemented in C++ Qt library
- New version end of Feb 2013
New Efficient OpenModelica MDT Run-time Debugger now also partly for Simulation Models
OMPython – Python Scripting with OpenModelica

- Interpretation of Modelica commands and expressions
- Interactive Session handling
- Library / Tool
- Optimized Parser results
- Helper functions
- Deployable, Extensible and Distributable
Prototype Parallel Multiple-Shooting and Collocation Dynamic Trajectory Optimization

- Minimize a goal function subject to model equation constraints, useful e.g. for NMPC
- Multiple Shooting/Collocation
  - Solve sub-problem in each sub-interval

\[
x_i(t_{i+1}) = h_i + \int_{t_i}^{t_{i+1}} f(x_i(t), u(t), t) \, dt \approx F(t_i, t_{i+1}, h_i, u_i), \quad x_i(t_i) = h_i
\]

Example speedup, 16 cores:

MULTIPLE_COLLOCATION

Paper in Modelica’2012 Conf.
Prototype, not yet in OpenModelica release.
Planned release 2013.
Prototypes of Parallel Execution with OpenModelica

- **ParModelica** – Parallel Algoritmic Modelica Code Execution on GPU
  - Speedup factor 300 of matrix multiplication on NVIDIA Fermi GPU

- **OPENMP** support in OpenModelica, parallelization of partitioned models
  - Speedup factor 4 of trivial model on 4-core machine
OpenModelica Compiler Bootstrapping

• Bootstrapping = OMC Compiler Compiles itself

• Advantages
  • **Faster** compilation for the developers
  • Complete Modelica language for **easier programming**
  • Better error messages and maintainability
  • Makes a faster Modelica **debugger** possible
  • Makes **performance** analysis possible
  • some **Modelica 4** like feature

• Status
  • Dec 2010, OMC first compiled itself
  • During 2011-now, used for development with the new debugger
  • Dec 2012. Automatic memory reclamation operational
Questionnaire to OSMC Org Members

• 23 Questions
• 36 out of 45 organizational members answered
• Slightly less than half OEM users of parts of OM compiler
• Slightly more than half end-users (usage for applications)
• 5 organizations only OEM users of compiler frontend (4 current, 1 near-future)
• 80% Research & Development usage of OpenModelica
Q: OEM usage (part of product of OpenModelica Compiler frontend)

Field summary for OEMF

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes (Y)</td>
<td>14</td>
<td>38.89%</td>
</tr>
<tr>
<td>No (N)</td>
<td>22</td>
<td>61.11%</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Pie chart showing:
- Yes (14) 39%
- No (22) 61%
Q: OEM Usage (part of product) of OpenModelica compiler backend/simulator

Field summary for OEMB

<table>
<thead>
<tr>
<th>OEM usage (part of product) of OpenModelica compiler backend/simulator</th>
<th>Count</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Yes (Y)</td>
<td>12</td>
<td>33.33%</td>
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<tr>
<td>No (N)</td>
<td>24</td>
<td>66.67%</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

67% No, 33% Yes
**Q: End User Application Usage of OpenModelica**

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
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<td>Yes (Y)</td>
<td>21</td>
<td>58.33%</td>
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<tr>
<td>No (N)</td>
<td>15</td>
<td>41.67%</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

**Field summary for EUSER**

End-user application usage of OpenModelica

42% Yes (21)  
58% No (15)
Q: Research and Development Usage of OpenModelica

Field summary for R_D

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
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<td>Yes (Y)</td>
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<td>No (N)</td>
<td>7</td>
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</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>0.00%</td>
</tr>
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</table>

Pie chart showing the distribution of responses:
- Yes (29) 81%
- No (7) 19%
Q: Systems Engineering, requirement handling (e.g. ModelicaML) usage/development

**Field summary for SysEng**

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<tr>
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<th>Percentage</th>
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</thead>
<tbody>
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<td>8</td>
<td>22.22%</td>
</tr>
<tr>
<td>No (N)</td>
<td>28</td>
<td>77.78%</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

![Pie chart showing 78% No (N) and 22% Yes (Y)]
Q: OpenModelica FMI Usage and/or Development

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
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<tr>
<td>Yes (Y)</td>
<td>14</td>
<td>38.89%</td>
</tr>
<tr>
<td>No (N)</td>
<td>22</td>
<td>61.11%</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
Q: Need for High Performance OpenModelica Tool (large models, fast simulation)

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Yes (Y)</td>
<td>25</td>
<td>69.44%</td>
</tr>
<tr>
<td>No (N)</td>
<td>11</td>
<td>30.56%</td>
</tr>
<tr>
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<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
Q: Much Usage/Importance of MultiBody Library

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Yes (Y)</td>
<td>11</td>
<td>30.56%</td>
</tr>
<tr>
<td>No (N)</td>
<td>25</td>
<td>69.44%</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>0.00%</td>
</tr>
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</table>
**Q: Coverage Importance of MSL MultiBody (1-5)**

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
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<th>Sum</th>
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<td>43.59%</td>
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<tr>
<td>2 (2)</td>
<td>4</td>
<td>10.26%</td>
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<td>3 (3)</td>
<td>7</td>
<td>17.95%</td>
<td>17.95%</td>
</tr>
<tr>
<td>4 (4)</td>
<td>2</td>
<td>5.13%</td>
<td></td>
</tr>
<tr>
<td>5 (5)</td>
<td>10</td>
<td>25.64%</td>
<td>30.77%</td>
</tr>
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</table>

**Sum (Answers)**: 36  
Number of cases: 36  
No answer: 0  
Arithmetic mean: 2.78  
Standard deviation: 1.66
Q: Performance Importance MultiBody (1 to 5)
Q: Much Usage/Importance of Fluid/Media

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes (Y)</td>
<td>19</td>
<td>52.78%</td>
</tr>
<tr>
<td>No (N)</td>
<td>17</td>
<td>47.22%</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>0.00%</td>
</tr>
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</table>

Field summary for Fluid

- Yes (19) - 53%
- No (17) - 47%
Q: Coverage Importance Fluid/Media (1 to 5)

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
<th>Sum</th>
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</thead>
<tbody>
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<td>20.51%</td>
<td>35.90%</td>
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<tr>
<td>2 (2)</td>
<td>6</td>
<td>15.38%</td>
<td></td>
</tr>
<tr>
<td>3 (3)</td>
<td>4</td>
<td>10.26%</td>
<td>10.26%</td>
</tr>
<tr>
<td>4 (4)</td>
<td>3</td>
<td>7.69%</td>
<td></td>
</tr>
<tr>
<td>5 (5)</td>
<td>15</td>
<td>38.46%</td>
<td>46.15%</td>
</tr>
<tr>
<td>Sum (Answers)</td>
<td>36</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Number of cases: 36
No answer: 0
Arithmetic mean: 3.31
Standard deviation: 1.67
### Q: Simulation Performance Fluid/Media (1 – 5)

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (1)</td>
<td>9</td>
<td>23.08%</td>
<td>38.46%</td>
</tr>
<tr>
<td>2 (2)</td>
<td>6</td>
<td>15.38%</td>
<td></td>
</tr>
<tr>
<td>3 (3)</td>
<td>5</td>
<td>12.82%</td>
<td>12.82%</td>
</tr>
<tr>
<td>4 (4)</td>
<td>5</td>
<td>12.82%</td>
<td></td>
</tr>
<tr>
<td>5 (5)</td>
<td>11</td>
<td>28.21%</td>
<td>41.03%</td>
</tr>
</tbody>
</table>

**Sum (Answers)**: 36  
**Percentage**: 100.00%  
**Sum**: 100.00%

- **Number of cases**: 36  
- **No answer**: 0  
- **Arithmetic mean**: 3.08  
- **Standard deviation**: 1.61

---

**Field summary for FluidSim**

<table>
<thead>
<tr>
<th>Importance OpenModelica Fluid/Media (MSL) or similar Simulation performance - 1-5), (1= slow, 5=fast simulation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>1 (1)</td>
</tr>
<tr>
<td>2 (2)</td>
</tr>
<tr>
<td>3 (3)</td>
</tr>
<tr>
<td>4 (4)</td>
</tr>
<tr>
<td>5 (5)</td>
</tr>
</tbody>
</table>

**Sum (Answers)**: 36  
**Percentage**: 100.00%  
**Sum**: 100.00%

- **Number of cases**: 36  
- **No answer**: 0  
- **Arithmetic mean**: 3.08  
- **Standard deviation**: 1.61
Q: Much Usage/Importance of Electrical lib

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes (Y)</td>
<td>12</td>
<td>33.33%</td>
</tr>
<tr>
<td>No (N)</td>
<td>24</td>
<td>66.67%</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

67% No, 33% Yes
Q: Simulation Coverage of Electrical lib (1 to 5)
Q: Simulation Performance of Electrical lib (1 to 5)

Field summary for ElectrSim
Importance OpenModelica Electrical (MSL) Simulation performance - 1-5), (1= slow, 5= fast simulation)

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
<th>Sum</th>
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</thead>
<tbody>
<tr>
<td>1 (1)</td>
<td>10</td>
<td>26.32%</td>
<td>42.11%</td>
</tr>
<tr>
<td>2 (2)</td>
<td>6</td>
<td>15.79%</td>
<td></td>
</tr>
<tr>
<td>3 (3)</td>
<td>9</td>
<td>23.68%</td>
<td>23.68%</td>
</tr>
<tr>
<td>4 (4)</td>
<td>0</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>5 (5)</td>
<td>10</td>
<td>26.32%</td>
<td>26.32%</td>
</tr>
</tbody>
</table>

Sum (Answers) 35 100.00% 100.00%

Number of cases 36 100.00%
No answer 1 2.78%
Arithmetic mean 2.83
Standard deviation 1.58
Q: Much Usage/Importance of OM Dev Environment

Field summary for OMDev

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes (Y)</td>
<td>10</td>
<td>27.78%</td>
</tr>
<tr>
<td>No (N)</td>
<td>26</td>
<td>72.22%</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
Q: Typical Appl Model Size (# of Equations)

Field summary for ModSize:

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Result</th>
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<tbody>
<tr>
<td>Count</td>
<td>32</td>
</tr>
<tr>
<td>Sum</td>
<td>534175.0000000000</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>25639.59</td>
</tr>
<tr>
<td>Average</td>
<td>16692.97</td>
</tr>
<tr>
<td>Minimum</td>
<td>5.0000000000</td>
</tr>
<tr>
<td>1st quartile (Q1)</td>
<td>1000</td>
</tr>
<tr>
<td>2nd quartile (Median)</td>
<td>10000</td>
</tr>
<tr>
<td>3rd quartile (Q3)</td>
<td>17500</td>
</tr>
<tr>
<td>Maximum</td>
<td>100000.0000000000</td>
</tr>
</tbody>
</table>

Null values are ignored in calculations
Q1 and Q3 calculated using minitab method
Q: Priority Modelica 3.3 Clocked & State Machines

Field summary for Prio
Priority of supporting new Modelica 3.3 synchronous and state machines features (1-5) (1=low, 5= high)

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (1)</td>
<td>8</td>
<td>20.51%</td>
<td>28.21%</td>
</tr>
<tr>
<td>2 (2)</td>
<td>3</td>
<td>7.69%</td>
<td></td>
</tr>
<tr>
<td>3 (3)</td>
<td>9</td>
<td>23.08%</td>
<td>23.08%</td>
</tr>
<tr>
<td>4 (4)</td>
<td>4</td>
<td>10.26%</td>
<td></td>
</tr>
<tr>
<td>5 (5)</td>
<td>12</td>
<td>30.77%</td>
<td>41.03%</td>
</tr>
</tbody>
</table>

Sum (Answers) 36 100.00% 100.00%

Number of cases 36 100.00%
No answer 0 0.00%
Arithmetic mean 3.25
Standard deviation 1.56

Pie chart showing distribution of answers.
The Open Source Modelica Consortium
Purpose of the Consortium

• The Open Source Modelica Consortium, created the 4th of December 2007 in Linköping, Sweden, in the following called OSMC, is a non-profit, non-governmental organization with the aim of developing and promoting the development and usage of the **OpenModelica open source implementation of the Modelica computer language** (also named Modelica modeling language) and OpenModelica **associated open-source tools and libraries**, collectively named the OpenModelica Environment, in the following referred to as OpenModelica.

• OpenModelica is **available for commercial and non-commercial usage under the conditions of the OSMC Public License**. It is the aim of OSMC, within the limitations of its available resources, to provide **support and maintenance of OpenModelica**, to support its publication on the web, and to **coordinate** contributions to OpenModelica.
Open Source Modelica Consortium
Originally Created Dec 4, 2007

7 Founding Organizational Members
• Bosch-Rexroth AG, Germany
• Equa Simulation AB, Sweden
• TLK Thermo, Germany
• VTT, Finland
• Linköping University, Sweden
• Hamburg University of Technology/TuTech, Institute of Thermo-Fluid Dynamics, Germany
• Technical University of Braunschweig, the Institut of Thermodynamik, Germany
OSMC – Open Source Modelica Consortium
45 organizational members December 2012

Founded Dec 4, 2007

Open-source community services

- Website and Support Forum
- Version-controlled source base
- Bug database
- Development courses
- www.openmodelica.org

Code Statistics
OSMC 45 Organizational Members, Dec 2012
(initially 7 members, 2007)

Companies and Institutes (24 members)
- ABB Corporate Research, Sweden
- Bosch Rexroth AG, Germany
- Siemens PLM, California, USA
- Siemens Turbo Machinery AB, Sweden
- CDAC Centre for Advanced Compu, Kerala, India
- Creative Connections, Prague, Czech Republic
- DHI, Aarhus, Denmark
- Evonik, Dehli, India
- Equa Simulation AB, Sweden
- Fraunhofer FIRST, Berlin, Germany
- Frontway AB, Sweden
- Gamma Technology Inc, USA
- IFP, Paris, France
- ISID Dentsu, Tokyo, Japan
- ITI, Dresden, Germany
- MathCore Engineering/ Wolfram, Sweden
- Maplesoft, Canada
- TLK Thermo, Germany
- Sozhou Tongyuan Software and Control, China
- VI-grade, Italy
- VTI, Linköping, Sweden
- VTT, Finland
- XRG Simulation, Germany

Universities (21 members)
- TU Berlin, Inst. UEBB, Germany
- FH Bielefeld, Bielefeld, Germany
- TU Braunschweig, Germany
- University of Calabria, Italy
- TU Dortmund, Germany
- TU Dresden, Germany
- Georgia Institute of Technology, USA
- Ghent University, Belgium
- Griffith University, Australia
- TU Hamburg/Harburg Germany
- KTH, Stockholm, Sweden
- Université Laval, Canada
- Linköping University, Sweden
- Univ of Maryland, Syst Eng USA
- Univ of Maryland, CEEE, USA
- Politecnico di Milano, Italy
- Ecoles des Mines, CEP, France
- Mälardalen University, Sweden
- Univ Pisa, Italy
- Telemark Univ College, Norway
- University of Ålesund, Norway
Open Source Modelica Consortium
Individual Members

(62 individual members, 4 February 2013)

Open Source Modelica Consortium – OSMC
Board of Directors 2012

- **Oliver Lenord**, OSMC Chairman; Manager, Siemens PLM, USA
- **Per Sahlin**, OSMC Vice Chairman; CEO, Equa Simulation AB
- **Peter Fritzson**, OSMC Director; Prof, Linköping University, Sweden
- **Juha Kortelainen**, Manager, VTT, Finland
- **Gerhard Schmitz**, Prof, Univ. Hamburg, Germany
- **Alf Isaksson**, Manager, ABB Corp. Research, Sweden
- **Francesco Casella**, Prof, Politecnico di Milano, Italy
- **Jan Brugård**, CEO, Wolfram MathCore AB, Sweden
- **Kilian Link**, Manager, Siemens, Germany (and Sweden)
- **Lars Mikelsons**, Manager, Bosch-Rexroth, Germany.
### OSMC Board – 7 Meetings Jan 1 2013 – Dec 31 2013

<table>
<thead>
<tr>
<th>Meeting dates</th>
<th>Board Work</th>
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<tr>
<td>120113</td>
<td>Planning and prioritizing the OSMC work</td>
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<tr>
<td>120314</td>
<td>Admitting new members</td>
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<tr>
<td>120504</td>
<td>Planning the workshop</td>
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<td>120614</td>
<td>Budget</td>
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<td>120828</td>
<td>etc.</td>
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<td>121018</td>
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<td>121211</td>
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Expanded Vision for OpenModelica Effort: Integrated Model-driven Development Based on OpenModelica, e.g. in OPENPROD project

Unified Modeling: Meta-modeling & Modelica & UML & OWL

Vision of unified modeling framework for model-driven product development from platform independent models (PIM) to platform specific models (PSM)
OPENPROD – OpenModelica related Project

- Duration: June 2009 – Dec 2012 (3.3 years)
- Budget: approx 11 Meuro, 94 Manyears
- 28 partners
- Very important for OpenModelica development
- Successful review Sept 2011 after 2 years
- Successful review Dec 2012 including most application demos
- (New project MODRIO approved, starting fall 2012)

Main workpackages

- Integrated hardware software modeling by Modelica - UML - SysML integration.
- Model compiler enhancements.
- Compilation of Modelica to parallel multi-core platforms.
- Tool interoperability.
- Application demonstrators.
Special Thanks

• The developers who worked very hard during 2012. Adrian Pop, Martin Sjölund, Per Östlund, Adeel Asghar, Jens Frenkel, Willi Braun, Lennart Ochel, Mahder Gebremedhin, Modelers Christian Schubert, Francesco Casella, Bruno Scaglioni, and several other people.

• The 45 OpenModelica consortium organizational members for support including Bosch-Rexroth, Wolfram-MathCore, Siemens Turbo Machinery, ABB, Siemens PLM, etc...

• Master students and PhD students who made important contributions.
Conclusions and Summary 2012

- OSMC expanded from 38 to 45 organizational members.
- Dec 2012/Jan 2013. Breakthrough Fluid support. 92% MSL 3.2.1 simulating. OpenModelica 1.9.0 beta3/4
- 2013. Good prospects for the future – towards a standard high quality open source Modelica implementation in Modelica, increased tool support for integrated systems engineering.

Questions?

www.openmodelica.org