

## PIETER J. MOSTERMAN

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**NATIONALITY** Netherlands citizenship  
USA green card holder

**SUMMARY** Researcher, innovator, and people connector with 20+ years of engineering experience, more than 100 peer-reviewed publications, and over 100 patents. Passionate about building new programs and leading cutting edge technology initiatives. Oversees the patent portfolio and strategy at MathWorks. Influencer and worldwide leading expert in the model-based design community.

Founder of the *MathWorks Advanced Research & Technology Office* that is chartered along three dimensions.

- *Innovate and Create Intellectual Property (IP)*: Defines and leads technology demonstrator (halo) projects. Authors advanced research publications. Oversees patent portfolio development and strategy.
- *Engage the Research Community*: Manages and cultivates relationship with expert influencers in academic research. Founded the MathWorks Research Summit network of excellence across academia, government, and industry to strengthen and valorize research. Advises multinational government agencies on strategy and research roadmaps.
- *Transfer Technology*: Directs and manages the research grant program for technology research and transfer. Identifies high impact research areas and provides advanced technology thought leadership.

**PROFESSIONAL** **MATHWORKS** Natick, MA  
06/16 – *Chief Research Scientist and Director, Advanced Research & Technology Office*

10/01 – 06/16 **MATHWORKS** Natick, MA  
*Senior Research Scientist, Design Automation Department*  
Guide and direct research and development of core Design Automation functionality and advanced technologies. Consult on the design of features and technologies of the Simulink Model-Based Design product suite for modeling, simulation, and code generation. Conceive and develop case study models to exemplify and highlight key methodological and technological challenges in networked embedded systems design (automobile power window, automotive powertrain, aircraft elevator redundancy management, and smart manufacturing robotics system). Technical content manager of the control design automation intellectual property portfolio. Organize events in the research community to further the state of the art in computational systems as tools and products. Provide guidance, advise, review, and consultation on research and education directions to government and academic organizations. Serve on various internal boards and advisory committees.

5/09 – **MCGILL UNIVERSITY** Montreal, Canada  
*Adjunct Professor, School of Computer Science*

9/97 – 8/01 **GERMAN AEROSPACE CENTER (DLR)** Oberpfaffenhofen, Germany  
*Research Associate, Control Design Engineering group, Institute of Robotics and Mechatronics*  
Implemented a hybrid bond graph modeling and simulation tool HYBRISIM and a hybrid system simulation environment MASIM for object-oriented models of dynamic systems based on *Modelica* in Java/C++.

- 1/99                   **STANFORD UNIVERSITY** Stanford, CA  
**Visiting Researcher**  
Modeling and diagnosis of physical systems.
- 6/92 – 8/97           **VANDERBILT UNIVERSITY** Nashville, TN  
**Teaching and Research Assistant**
- 7/96 – 8/97           Developed a hybrid bond graph modeling methodology and diagnosis engine (TRANSCEND) and applied it to a cooling system in a fast breeder reactor and a Chevrolet 350 V8 combustion engine.
- 6/92 – 6/96           Created high-fidelity simulation software in Visual Basic to emulate an undergraduate electronics laboratory with built-in coach.
- 2/93 – 6/96           **VANDERBILT UNIVERSITY MEDICAL CENTER** Nashville, TN  
**Paradox and FORTRAN consultant, Pediatrics Department**  
Maintained a Paradox patient database program and a FORTRAN transplant diagnosis program.
- 4/90 – 8/90           **NORTHERN TELECOM** Nashville, TN  
**Internship, detached at Vanderbilt University**  
Programmed the team synergy analysis of a quality improvement tool in Smalltalk-80 & CLIPS.
- EDUCATION**
- 4/97                   **VANDERBILT UNIVERSITY** Nashville, Tennessee  
*Doctor of Philosophy*, Electrical and Computer Engineering  
Center for Intelligent Systems
- 6/91                   **UNIVERSITY OF TWENTE** Enschede, The Netherlands  
*Master of Science*, Electrical Engineering  
Control Systems and Computer Engineering Group
- 6/87                   *Bachelor of Science*, Electrical Engineering, June 1987
- AWARDS AND HONORS**
- The 2014 Spring Simulation Multi-Conference* **Overall Best Paper Award** for the paper “Rule-Based Model Transformation For, and In Simulink” by J. Denil, P. J. Mosterman, and H. Vangheluwe
- Best Symposium Award** for the *Symposium on Theory of Modeling and Simulation (TMS'12)* at the *2012 Spring Simulation Multiconference (SpringSim'12)*, March 26-28, Orlando, FL, 2012
- Awarded the **Distinguished Service Award** of *The Society for Modeling & Simulation International (SCS)* as Former Editor-in-Chief for SCS Journals 2009
- Awarded the 2003 *Institution of Mechanical Engineers (IMEchE)* **Donald Julius Groen Prize** for the article  
P. J. Mosterman, “HYBRSIM - A Modeling and Simulation Environment for Hybrid Bond Graphs,” *Journal of Systems and Control Engineering*, vol. 216, Part I, pp. 35-46, 2001
- Awarded **Editor Choice** honors for
- P. J. Mosterman and H. Vangheluwe, “Computer Automated Multi-Paradigm Modeling: An Introduction,” in *SIMULATION: Transactions of The Society for Modeling and Simulation International*, vol. 80, nr. 9, pp. 433-450, 2004
  - P. J. Mosterman and G. Biswas, “A Hybrid Modeling and Simulation Methodology for Dynamic Physical Systems,” in *SIMULATION: Transactions of The Society for Modeling and Simulation International*, Vol. 78, No. 1, pp. 5-17, 2002
- Nominated for the **Computerworld Smithsonian Award** by Microsoft Corporation for the *Electronics Laboratory Simulator* educational software, 1994
- GRANTS**
- Awarded a \$55,000 **grant** by Hewlett-Packard Co. as investigator on *An Experimental Testbed for Model-Based Monitoring, Prediction and Diagnosis of Physical Systems*, 1997

Awarded a \$100,000, 2 year **grant** by Mitsubishi as investigator on *A Systematic Integrated Methodology for Prediction, Monitoring, and Diagnosis of Complex Dynamic Systems*, 1995

## GRADUATE STUDENTS

**Secondary Grader** of the Ph.D. work of

- A. Naderlinger, *Modeling of Real-time Software Systems Based on Logical Execution Time*, University of Salzburg, Austria, 2009

**Member** of the Ph.D. committee of

- Z. Jiang, *From Verified Models to Verified Code for Safe Medical Devices*, University of Pennsylvania, Philadelphia, PA, 2016
- J. Denil, *Design, Verification and Deployment of Software Intensive Systems—A Multi-Paradigm Modelling Approach*, University of Antwerp, Antwerp, Belgium, 2013
- M. Yunt, *Dynamic Optimization with Hybrid Systems Embedded to Determine Optimal Mode Sequences*, Massachusetts Institute of Technology, Cambridge, MA, 2010
- J. Jacobs, *Model-Based Application Development for Massively Parallel Embedded Systems*, University of Twente, Enschede, Netherlands, 2008
- E. Benazera, *Diagnosis and Reconfiguration based on Hybrid Concurrent Models. Application to Autonomous Satellites*, University Paul-Sabatier, Toulouse, France, 2003

**External Examiner** of the M.Sc. work of

- C. Adourian, *Bidirectional Integration Of Geometric And Dynamic Simulation Tools*, McGill University, Montréal, Québec, 2010

**Member** of the M.Sc. committee of

- C. L. Plumlee, *Application Development Process for GNAT, A SOC Networked System*, University of New Hampshire, Durham, NH, 2008
- T. Jankowski, *An Architecture and Technology for Ambient Intelligence Node*, University of New Hampshire, Durham, NH, 2008

## EDITORIAL SERVICE

**Series Editor** for CRC Press of a series of books on *Computational Analysis, Synthesis, and Design of Dynamic Systems* including (2008 – )

- *Computation for Humanity: Information Technology to Advance Society*, J. Zander and P. J. Mosterman (editors), ISBN 9781439883273, 2013
- *Real-time Simulation Technologies: Principles, Methodologies, and Applications*, K. Popovici and P. J. Mosterman (editors), ISBN 9781439846650, 2012
- *Model-Based Testing for Embedded Systems*, J. Zander, I. Schieferdecker, and P. J. Mosterman (editors), ISBN 9781439818459, 2011
- *Discrete-Event Modeling and Simulation: Theory and Applications*, G. A. Wainer and P. J. Mosterman (editors), ISBN 9781420072334, 2010
- *Model-Based Design for Embedded Systems*, G. Nicolescu and P. J. Mosterman (editors), ISBN 9781420067842, 2009
- *Multi-Agent Systems: Simulation and Applications*, A. M. Uhrmacher and D. Weyns (editors), ISBN 9781420070231, 2009
- *Discrete-Event Modeling and Simulation: A Practitioner's Approach*, G. A. Wainer, ISBN 9781420053364, 2009

**Editor-in-Chief** for the Methodology section of *SIMULATION: Transactions of the Society for Modeling and Simulation International* (2005 – 2008)

Mechatronics **Area Editor** of *SIMULATION: Transactions of the Society for Modeling and Simulation International* (2002 – 2005)

**Guest Editor** for special issues on:

- Fault Detection and Diagnosis of Wind Turbines of the *Journal of Control Science and Engineering*, 2012
- Computer Automated Multiparadigm Modeling (CAMPaM) of
  - *SIMULATION: Transactions of The Society for Modeling and Simulation International* (vol. 85, nr. 11/12, November/December, 2009)
  - *IEEE Transactions on Control System Technology* (vol. 12, nr. 2, March, 2004)
  - *ACM Transactions on Modeling and Computer Simulation* (vol. 12, nr. 4, October, 2002)

**Associate Editor** of

- *International Journal of Critical Computer-Based Systems* (2008 – )
- *The International Journal of Applied Intelligence, Neural Networks, and Complex Problem-Solving Technologies* (1997 – 2017)
- *IEEE Conference on Control Applications* (CCA 2013)
- *2nd International Conference on Control and Fault-Tolerant Systems* (SysTol'13)
- *IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes* (2012)
- *International Journal of Control and Automation* (2008 – 2011)
- *Journal of Defense Modeling and Simulation: Applications, Methodology, Technology* (2005 – 2010)
- *IEEE Transactions on Control Systems Technology* (2003 – 2009)
- *IEEE Computer Aided Control System Design Symposium* (2004, 2008)

**EVENT**

**ORGANIZATION**

**General Chair** of:

- *The Symposium on Theory of Modeling and Simulation*, San Diego, CA, 2013
- *The Symposium on Theory of Modeling and Simulation*, Orlando, FL, March 26-28, 2012
- *The Designing for Embedded Parallel Computing Platforms: Architectures, Tools, and Applications* workshop at the *Design Automation and Test in Europe Conference and Exhibition* Nice, France, April 24, 2009

**Program Chair** of

- *The Model-Based Design for Embedded Systems* track at the *Design Automation and Test in Europe Conference and Exhibition*, 2007, 2008, and 2009
- The workshop on *Multiparadigm Modeling: Concepts and Tools* at the *ACM/IEEE 10th International Conference on Model Driven Engineering Languages and Systems*, Nashville, TN, September 30 - October 5, 2007
- *The Computational Modeling and Simulation of Embedded Systems* track at the *2007 Summer Computer Simulation Conference*, San Diego, California, July 15-18, 2007
- *The International Conference on High Level Simulation Languages and Applications*, San Diego, CA, January 14-18, 2007
- The annual *Bellairs International Workshop on Computer Automated Multiparadigm Modeling*, McGill University Bellairs Research Institute, Barbados, since 2004
- *The 14<sup>th</sup> International Workshop on Principles of Diagnosis*, Washington D.C., June 11-14, 2003

**Industrial Co-Chair** of the *3<sup>rd</sup> IFAC Conference on Analysis and Design of Hybrid Systems* (ADHS'09), Zaragoza, Spain, September 16-18, 2009

**Invited Sessions Chair** of the *2006 IEEE Computer Aided Control System Design (CACSD) Symposium*, Munich, October 4-6, Germany

**Organizer and Chair** of

- *2019 MathWorks Asia Research Summit*, Tokyo, Japan, September 6-7, 2019
- *2019 MathWorks Research Summit*, Newton, MA, June 1-3, 2019
- *2018 MathWorks Asia Research Summit*, Tokyo, Japan, September 7-8, 2018
- *2018 MathWorks Research Summit*, Newton, MA, June 2-4, 2018

- 2017 MathWorks Asia Research Summit, Tokyo, Japan, November 2-3, 2017
- 2017 MathWorks Research Summit, Newton, MA, June 3-5, 2017
- 2016 MathWorks Asia Research Summit, Tokyo, Japan, September 30-October 1, 2016
- 2016 MathWorks Research Summit, Newton, MA, June 4-6, 2016
- 2015 MathWorks Asian Research Faculty Summit, Tokyo, Japan, November 8-9, 2015
- 2015 MathWorks Research Faculty Summit, Newton, MA, June 6-8, 2015
- *Design, Automation & Test in Europe (DATE) panel session on Critical Research Areas Driven by Industry Transformations*, with John Zhao, Grenoble, France, March 11, 2015
- 2014 MathWorks Asian Research Faculty Summit, Tokyo, Japan, November 14-15, 2014
- 2014 MathWorks Research Faculty Summit, Newton, MA, June 7-9, 2014
- 2013 MathWorks Research Faculty Summit, Newton, MA, June 1-3, 2013
- *Research Faculty Advisory Track at the MathWorks Advisory Board meetings*, Newton, MA, June 12-14, 2012
- *Fault Detection and Fault Tolerant Control for Wind Energy competition* in four parts:
  - Part I: *Fault Detection and Isolation of a Wind Turbine* with results presented at the *IFAC World Congress*, Milano, Italy, 2011
  - Part II: *Fault Tolerant Control of a Wind Turbine* with results presented at the *IFAC Safeprocess* symposium, Mexico City, Mexico, 2012
  - Part III: *Fault Detection and Location of a Wind Farm*, with results presented at the *IEEE Conference on Decision and Control*, Firenze, Italy, 2013
  - Part IV: *Fault Tolerant Control of a Wind Farm*, with results presented at the *IFAC World Congress*, Cape Town, South Africa, 2014
- *Cyber-Physical Systems Week (CPSWeek) tutorial session on Model-Based Design of Cyber-Physical Systems*, 2013
- *Cyber-Physical Systems Week (CPSWeek) panel session on The Future of CPS Education and Workforce Training—lessons learned and the road ahead*, 2013
- **Workshop** on *a New England Network of Excellence for Cyber-Physical Systems*, MathWorks, Natick, MA, 2012
- *ACM/IEEE 15<sup>th</sup> International Conference on Model Driven Engineering Languages and Systems tutorial session on Processing Simulink Models with Graph Rewriting-Based Transformation*, 2012
- *US Department of Homeland Security workshop on Grand Challenges in Modeling, Simulation, and Analysis for Homeland Security plenary industry panel session on Data Needs in Computational Modeling and Simulation—An Industry Perspective*, 2010
- *IEEE Conference on Decision and Control panel sessions* on
  - *Designing Better Control Systems with Computational Models*, 2009
  - *How do control system design engineers use models and simulation?* 2005
  - *Challenges and Solution Techniques for Hybrid Simulation*, 2004
- *Design Automation and Test in Europe Conference and Exhibition tutorial session on Automatically Realising Embedded System from High-Level Functional Models*, 2008
- *International Conference on High Level Simulation Languages and Applications panel session on Model Component Standardization and Certification*, 2007
- *2<sup>nd</sup> IFAC Conference on Analysis and Design of Hybrid Systems interactive session on Hybrid Simulation Tools: Principles, Challenges, and Applications*, 2006
- *Computer Automated Multiparadigm Modeling special sessions* at
  - 2007 High Level Simulation Languages and Applications Conference
  - IEEE CACSD Symposium, 2000 (two session), 2004, and 2006
  - 2001 IEEE Conference on Control Applications

**STEERING  
COMMITTEE**

Member of the Steering Committee of:

- *Multi-Paradigm Modeling for Cyber-Physical Systems* workshop (MPM4CPS), 2019
- the *Ninth International Workshop on Multi-Paradigm Modeling: Concepts and Tools* (MPM'15), 2015

- the *Eighth International Workshop on Multi-Paradigm Modeling: Concepts and Tools* (MPM'14), 2014
- *2014 Summer Simulation Multiconference* (SummerSim'14), 2014
- *The Symposium on Theory of Modeling and Simulation* (TMS'14), 2014
- the *Seventh International Workshop on Multi-Paradigm Modeling: Concepts and Tools* (MPM'13), 2013
- the *Sixth International Workshop on Multi-Paradigm Modeling: Concepts and Tools* (MPM'12), 2012
- *National Institute of Standards and Technology (NIST) CTO Roundtable on Cyber-Physical Systems: Building Safety, Security, Reliability, and Robustness into the Smart Systems of the Future*, Washington, DC, June 18, 2012
- *National Institute of Standards and Technology (NIST) Foundations for Innovation in Cyber-Physical Systems Workshop*, Rosemont, IL, 2012
- the *Fifth International Workshop on Multi-Paradigm Modeling: Concepts and Tools* (MPM'11), 2011
- the *Fourth International Workshop on Multi-Paradigm Modeling: Concepts and Tools* (MPM'10), 2010

**EXPERT  
COMMITTEE**

Member of the Expert Committee for the *Spaceship European Astronaut Centre (EAC) Workshop* (SPACESHIP EAC), June 19-21, 2012

**AWARD  
COMMITTEE**

Member of the Award Committee for:

- Multimedia Star Innovator Award Board of the *IEEE International Conference on Multimedia and Expo*, 2019
- Best student paper of *Hybrid Systems: Computation and Control* conference, 2014
- Best Paper of the *Symposium on Theory of Modeling and Simulation*, 2012
- Outstanding Paper of *IEEE Transactions on Control Systems Technology*, 2007

**PROGRAM  
COMMITTEES**

Member of the Program Committee for the following symposia, conferences, and workshops

- *MDE in Practice* track at the *ACM/IEEE 18<sup>th</sup> International Conference on Model Driven Engineering Languages and Systems* (MODELS 2015)
- *Tutorials* track at the *ACM/IEEE 18<sup>th</sup> International Conference on Model Driven Engineering Languages and Systems* (MODELS 2015)
- *MDE in Practice* track at the *ACM/IEEE 17<sup>th</sup> International Conference on Model Driven Engineering Languages and Systems* (MODELS 2014)
- *25<sup>th</sup> International Workshop on Principles of Diagnosis* (DX'14)
- *Embedded Software and Systems* track at the *51<sup>st</sup> Design Automation Conference* (DAC 2014)
- *17<sup>th</sup> International Conference on Hybrid Systems: Computation and Control* (HSCC 2014)
- *Complex Systems Design & Management* (CSD&M'13)
- *The 2<sup>nd</sup> International Conference on Control and Fault-Tolerant Systems* (SysTol'13)
- *2013 Workshop on Embedded and Cyber-Physical Systems Education* (WESE'13) at *Embedded Systems Week*, 2013
- *24<sup>th</sup> International Workshop on Principles of Diagnosis* (DX-2013)
- *16<sup>th</sup> International MODELS Conference: Model Driven Engineering Languages and Systems* (MODELS 2013)
- *The International Workshop on The Globalization of Modeling Languages* (GEMOC 2013) at the *16<sup>th</sup> International MODELS Conference: Model Driven Engineering Languages and Systems* (MODELS 2013)
- *The IEEE Conference on Control Applications* (CCA 2013) at the *2013 IEEE Multi-Conference on Systems and Control* (MSC 2013)
- *The Second International Conference on Intelligent Systems and Applications* (INTELLI 2013) at *NexComm 2013*
- *5<sup>th</sup> International Workshop on Equation-based Object-oriented Languages and Tools* (EOOLT'13)

- *16<sup>th</sup> International Conference on Hybrid Systems: Computation and Control (HSCC 2013)*
- *18<sup>th</sup> IEEE International Conference on Parallel and Distributed Systems (ICPADS 2012)*
- *Time Analysis and Model-Based Design, from Functional Models to Distributed Deployments (TiMoBD 2012) workshop at the Embedded Systems Week*
- *The 6<sup>th</sup> International Conference on Integrated Modeling and Analysis in Applied Control and Automation (IMAACA 2012) at the 9<sup>th</sup> International Mediterranean and Latin American Modelling Multiconference (I3M2012)*
- *The 2nd International Conference on Simulation and Modeling Methodologies, Technologies and Applications (SIMULTECH 2012)*
- *The 4<sup>th</sup> IFAC Conference on Analysis and Design of Hybrid Systems (ADHS 2012)*
- *The First International Conference on Intelligent Systems and Applications (INTELLI 2012) at NexComm 2012*
- *The 18<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS 2012)*
- *2011 IEEE International Conference on Intelligent Robotics, Automations and Applications (IROA-11)*
- *22<sup>nd</sup> International Workshop on Principles of Diagnosis (DX-2011)*
- *30<sup>th</sup> International Conference on Computer Safety, Reliability and Security (SAFECOMP 2011)*
- *4<sup>th</sup> International Workshop on Equation-based Object-oriented Languages and Tools (EOOLT'11)*
- *The 5th International Conference on Integrated Modeling and Analysis in Applied Control and Automation (IMAACA 2011)*
- *Workshop on the Design, Modeling and Evaluation of Cyber Physical Systems (CyPhy'11) at the Seventh International Wireless Communications and Mobile Computing Conference (IWCMC'11)*
- *International Workshop for Formal Methods and Agile Methods (FM+AM'11) at the 17<sup>th</sup> International Symposium on Formal Methods (FM 2011)*
- *The Symposium On Theory of Modeling and Simulation—DEVS Integrative M&S Symposium (DEVS'11)*
- *International Symposium on Control and Automation (CA 2010)*
- *21<sup>th</sup> International Workshop on Principles of Diagnosis (DX-10)*
- *The 4<sup>th</sup> International Conference on Integrated Modeling and Analysis in Applied Control and Automation (IMAACA 2010)*
- *Doctoral Symposium at ACM/IEEE 13th International Conference on Model Driven Engineering Languages and Systems (MoDELS '10)*
- *3<sup>rd</sup> International Workshop on Equation-based Object-oriented Languages and Tools (EOOLT'09)*
- *International Workshop for Formal Methods and Agile Methods (FM+AM'10) at the International Conference on Formal Engineering Methods (ICFEM'10)*
- *Symposium on Very Large and Complex Systems at the International Conference on Grand Challenges in Modeling and Simulation (GCMS'10)*
- *The Modeling and Simulation of Dynamic Structure Systems track at the Summer Computer Simulation Conference (SummerSim2010)*
- *IEEE Symposium on Industrial Embedded Systems (SIES 2010)*
- *International Workshop on Formalization of Modeling Languages (FML 2010)*
- *7<sup>th</sup> International Conference on Informatics in Control, Automation and Robotics (ICINCO 2010)*
- *8<sup>th</sup> International Workshop on Modelling, Simulation, Verification and Validation of Enterprise Information Systems (MSVVEIS 2010)*
- *The Cyber-Physical Systems Track at the 2010 IEEE International Conference on Sensor Networks, Ubiquitous, and Trustworthy Computing (SUTC 2010)*
- *The Symposium On Theory of Modeling and Simulation—DEVS Integrative M&S Symposium (DEVS'10)*

- *The Science & Technology Directorate US Department of Homeland Security workshop on Grand Challenges in Modeling, Simulation, and Analysis for Homeland Security (MSAHS-2010)*
- *International Symposium on Control and Automation (CA 2009)*
- *International Workshop for Formal Methods and Agile Methods (FM+AM'09) at the International Conference on Formal Engineering Methods (ICFEM'09)*
- *3<sup>rd</sup> International Workshop on Equation-based Object-oriented Languages and Tools (EOOLT'09)*
- *3<sup>rd</sup> Workshop on Multi-Paradigm Modeling: Concepts and Tools (MPM'09)*
- *Doctoral Symposium at ACM/IEEE 12<sup>th</sup> International Conference on Model Driven Engineering Languages and Systems (MoDELS '09)*
- *First International Workshop on Critical Computer Based Systems (CCBS'09)*
- *Conference on Grand Challenges in Modeling and Simulation (GCMS'09)*
- *IEEE Symposium on Industrial Embedded Systems (SIES 2009)*
- *7<sup>th</sup> IFAC Symposium on Fault Detection, Supervision and Safety of Technical Processes (IFAC SAFEPROCESS 2009)*
- *20<sup>th</sup> International Workshop on Principles of Diagnosis (DX-09)*
- *6<sup>th</sup> International Conference on Informatics in Control, Automation and Robotics (ICINCO 2009)*
- *7<sup>th</sup> International Workshop on Modelling, Simulation, Verification and Validation of Enterprise Information Systems (MSVVEIS 2009)*
- *The Real-time and Embedded Applications, Benchmarks and Tools track at the 15<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS 2009)*
- *Second International Conference on Simulation Tools and Techniques for Communications, Networks and Systems (SIMUTools 2009)*
- *The SPIE Defense, Security, and Sensing conference program track on Unmanned, Robotic, and Layered Systems topic of Industrial Robotics and Manufacturing, 2009*
- *2008 International Conference on Control and Automation (CA 2008)*
- *The Fault-Diagnostics track of the International Conference on Prognostics and Health Management 2008 (PHM 2008)*
- *Doctoral Symposium at ACM/IEEE 11<sup>th</sup> International Conference on Model Driven Engineering Languages and Systems (MoDELS '08)*
- *2008 IEEE International Symposium on Computer Aided Control System Design (CACSD 2008)*
- *Workshop on Equation-based Object-oriented Languages and Tools (EOOLT'08)*
- *19<sup>th</sup> International Workshop on Principles of Diagnosis (DX-08)*
- *18<sup>th</sup> European Conference on Artificial Intelligence (ECAI 2008)*
- *6<sup>th</sup> International Workshop on Modelling, Simulation, Verification and Validation of Enterprise Information Systems (MSVVEIS 2008)*
- *22<sup>nd</sup> European Conference on Modelling and Simulation (ECMS 2008)*
- *First International Conference on Simulation Tools and Techniques for Communications, Networks and Systems (SIMUTools 2008)*
- *5<sup>th</sup> International Conference on Informatics in Control, Automation and Robotics (ICINCO 2008)*
- *4<sup>th</sup> Workshop on Object-oriented Modeling of Embedded Real-Time Systems (OMER 4), 2007*
- *Second International Conference on Performance Evaluation Methodologies and Tools (VALUETOOLS 2007)*
- *Workshop on Equation-based Object-oriented Languages and Tools (EOOLT'07)*
- *18<sup>th</sup> International Workshop on Principles of Diagnosis (DX-07)*
- *4<sup>th</sup> international ICSE workshop on Software Engineering for Automotive Systems (SEAS 2007)*
- *3<sup>rd</sup> International Conference on Integrated Modeling & Analysis in Applied Control & Automation (IMAACA 2007)*



- 14<sup>th</sup> AI, Simulation and Planning in High Autonomy Systems Conference (AIS) and the 3<sup>rd</sup> Conceptual Modeling and Simulation Conference (CMS), 2007
- Workshop on Multi-Paradigm Modeling: Concepts and Tools (MPM'06)
- 2006 SCS International Conference on Modeling and Simulation - Methodology, Tools, Software Applications (M&S-MTSA'06)
- The Modelling and Simulation Methodologies track at the 20<sup>th</sup> European Conference on Modelling and Simulation (ECMS 2006)
- 9. Fachtagung Entwurf komplexer Automatisierungssysteme (EKA 2006)
- 2<sup>nd</sup> IFAC Conference on Analysis and Design of Hybrid Systems (ADHS'06)
- 17<sup>th</sup> International Workshop on Principles of Diagnosis (DX-06)
- 3<sup>rd</sup> international ICSE workshop on Software Engineering for Automotive Systems (SEAS 2006)
- International Conference on Integrated Modeling & Analysis in Applied Control & Automation (IMAACA2005)
- 16<sup>th</sup> International Workshop on Principles of Diagnosis (DX-05)
- 19<sup>th</sup> International Workshop on Qualitative Reasoning (QR-05)
- International Embedded and Hybrid Systems Conference (IEHSC 2005)
- 5<sup>th</sup> Symposium on Formal Methods for Automation and Safety in Railway and Automotive Systems (FORMS/FORMAT 2004)
- International Conference on Integrated Modeling & Analysis in Applied Control & Automation (IMAACA2004)
- Conference on Conceptual Modeling and Simulation (CSM2004)
- 15<sup>th</sup> International Workshop on Principles of Diagnosis (DX-2004)
- 2004 IEEE International Symposium on Computer Aided Control Systems Design (CACSD'04)
- 1<sup>st</sup> IFAC Conference on Analysis and Design of Hybrid Systems (ADHS'03)
- 8. Fachtagung Entwurf komplexer Automatisierungssysteme (EKA 2003)
- International Workshop on Principles of Diagnosis (DX-02)
- 5<sup>th</sup> Portuguese Conference on Automatic Control (CONTROLO 2002)
- Hybrid Systems: Computation and Control 2002 (HSCC 2002)
- 2000 IEEE International Symposium on Computer Aided Control System Design (CACSD 2000)
- Eleventh International Workshop on Principles of Diagnosis (DX-00)
- IEEE SoutheastCon 2000
- Tenth International Workshop on Principles of Diagnosis (DX-99)

**TECHNICAL COMMITTEES**

**Chair** of the IEEE Control System Society *Virtual Action Group on Hybrid Dynamic Systems for CACSD* (1998 – 2010)

**Member of**

- IEEE ad hoc committee on the *Future of Information and Convening* (2015 – )
- International Federation of Automatic Control (IFAC) technical committee on
  - *Discrete Event and Hybrid Systems* (2005 – )
  - *Mechatronic Systems*
  - *Fault Detection, Supervision and Safety of Technical Processes, SAFEPROCESS* (2003 – )
  - *Computers for Control* ( - 2014)
  - *Computer-Aided Control System Design (CACSD)* (2000 - 2002)
- Institute of Electrical and Electronics Engineers (IEEE) Control Systems Society *Technical committee on Hybrid Systems* (2014 - )
- Institute of Electrical and Electronics Engineers (IEEE) *Technical Committee on Computer-Aided Control System Design* (1998 – )
- Design group of the *Modelica* language for modeling physical systems (1997 – 1999)

**ADVISORY**

Advisory Committee of the *Analysis, Simulation, and Systems Engineering Software Strategies*

## BOARDS

(ASSESS) initiative (2015 - )

Advisory Committee of the *Workshop on Design, Modeling and Evaluation of Cyber Physical Systems*, CyPhy (2013 - )

Advisory Board of the Globalization of Modeling Languages (GEMOC) initiative (2013 - )

Industrial Advisory Board of the National Science Foundation research project *Expeditions in Computer Augmented Program Engineering*, ExCAPE (2012 - )

Industrial Advisory Board of the European Commission research project *Model-based synthesis of digital electronic circuits for embedded control*, MOBY-DIC (2011 – 2012)

Engineering Advisory Board of the *Lifeboat Foundation*, a nonprofit nongovernmental organization (2010 – )

Advisory Board on *Modeling, Simulation, and Analysis of the Critical Infrastructure* of the Department of Homeland Security (2009)

Industrial Advisory Board of the European Commission research project *Integrated Multi-formalism Tool Support for the Design of networked Embedded Control Systems*, MULTIFORM (2008 – 2012)

The Editorial Advisory Board of *SIMULATION: Transactions of The Society for Modeling and Simulation International* (2008 – )

Industry Advisory Board for a Master of Science and Master of Engineering in Mechatronic Systems Engineering program at *Lawrence Technological University* (2005 – 2012)

*MathWorks Automotive Advisory Board* (MAAB) North America working group for physical modeling (2005 – 2010)

International Industrial Advisory Board of the *2003 International Conference on Bond Graph Modeling and Simulation* (ICBGM'03)

## EXTERNAL REVIEWER

**Expert Panel Member** for:

- the *National Sciences and Engineering Research Council of Canada* (2013)
- the *National Science Foundation* (2011)
- the *European Commission Seventh Framework Programme* (2009)

**Expert Reviewer** for the European Commission ESPRIT project *SHE: Interactive training simulator of hydraulic excavators* (1998 – 2001)

**Reviewer** of research proposals for

- *Natural Sciences and Engineering Research Council of Canada* (NSERC) Discovery Grants competition
- National Science Foundation (NSF)
- Department of Homeland Security
- European Commission
- Netherlands Organisation for Scientific Research (NWO)
- Swiss National Science Foundation (SNSF)

## INVITED EVENTS

The *Analysis, Simulation, and Systems Engineering Software Strategies* congress (ASSESS 2016), Potomac, Maryland, January 20-22, 2016

Joint National Science Foundation (NSF) and German Embassy (BMBF) workshop on *Internet of Things (IoT) and Cyber-Physical Systems (CPS)*, Washington, DC, January 19-20, 2016

Workshop on *Research Challenges in Modeling & Simulation for Engineering Complex Systems*, Arlington, VA, January 13-14, 2016

Ambassador at the *Analysis, Simulation, and Systems Engineering Software Summit* Santa Fe, (ASSESS 2015), New Mexico, January 8-9, 2015

Workshop on *System Design meets Equation-based Languages*, Lund, Sweden, September 19-21, 2012

Defense Sciences Research Council (DSRC) *Open Intuitive Multiphysics CAD Workshop*, Arlington, Virginia, October 28-29, 2010

Toyota Motor Corporation *Workshop on Modeling Language Transformation*, Toyota Technical Center facilities, Ann Arbor, Michigan, September 19-21, 2010

Department of Homeland Security Science & Technology (DHS S&T) *Workshop on Future Directions in Critical Infrastructure Modeling & Simulation*, Suffolk, Virginia, October 28-30, 2008

National Science Foundation/Computing Research Association/Computing Community Consortium *Roadmapping Workshop on Robotics in Automation and Manufacturing*, Arlington, Virginia, June 17, 2008

National Science Foundation (NSF) *Summit on Cyber-Physical Systems*, St. Louis, Missouri, April 24-25, 2008

Office of Naval Research (ONR) *Kick-off Meeting on the Software and Systems Test Track*, Arlington, Virginia, August 8, 2006

Office of the Secretary of Defense (OSD) Research and Engineering 2006 *Workshop on Software-Intensive System Producibility Research*, Rosslyn, Virginia, May 17-19, 2006

Dagstuhl Seminars on

- *Globalizing Domain-Specific Languages*, 2014
- *The Pacemaker Challenge: Developing Certifiable Medical Devices*, 2014
- *Meta-Modeling Model-Based Engineering Tools*, 2013
- *Architecture-Driven Semantic Analysis of Embedded Systems*, 2012
- *Models@run.time*, 2011
- *Science and Engineering of Cyber-Physical Systems*, 2011
- *Verification over Discrete-Continuous Boundaries*, 2010
- *Software Engineering for Self-Adaptive Systems*, 2008
- *Model-Based Engineering of Embedded Real-Time Systems*, 2007
- *Quantitative Aspects of Embedded Systems*, 2007
- *Simulation and Verification of Dynamic Systems*, 2006
- *Grand Challenges for Modelling and Simulation*, 2002

Panel sessions on

- “Safety Challenges in Freely Composed CPS,” C. Vishik (chair), at the *Exploring the Dimensions of Trustworthiness: Challenges and Opportunities Workshop*, National Institute of Standards and Technology (NIST), Gaithersburg, MD, August 30, 2016
- “Debate—Regulators should not specify acceptable necessary and sufficient evidence for assurance of software-intensive systems within their domain,” Alan Wassung (organizer), at the *16<sup>th</sup> Software Certification Consortium Meeting*, Philadelphia, PA, January 12, 2016
- “The role of robustness in hybrid systems,” Martin Fränzle (organizer), at the *17<sup>th</sup> International Conference on Hybrid Systems: Computation and Control (HSCC 2014)*, Berlin, Germany, April 15, 2014
- *Industry Panel: “Modeling Complex Industrial Systems,”* Alessandro Pinto (organizer), at the *Embedded Systems Week*, Montreal, Canada, October 1, 2013
- “Software Design Methodology Research in the Age of Big Data and Flying Robots” at the *Expeditions in Computer Augmented Program Engineering Annual Principal Investigators Meeting*, University of California, Berkeley, CA, June 10, 2013
- *Industry Session at the 19th IEEE Real-Time and Embedded Technology and Applications Symposium*, Philadelphia, PA, April 10, 2013

- *Design and Manufacturing Panel* at the *NSF Cyber-Physical Systems Principal Investigators' Meeting*, Washington, DC, October 4, 2012
- *Technology and Service Provider Perspectives Panel* at the *CTO Roundtable on Cyber-Physical Systems: Building Safety, Security, Reliability, and Robustness into the Smart Systems of the Future*, Washington, DC, June 18, 2012
- *Requirements from industry on M@RT*, Uwe Abmann (organizer), at the *Models@run.time (M@RT) Dagstuhl Seminar*, November 29, 2011
- *Conversation with Government and Industry: Health and Medical CPS Government/Industry panel discussion*, Helen Gill (organizer), at the *Cyber-Physical Systems Principal Investigator Meeting*, National Harbor, MD, August 1, 2011
- *Cross-Disciplinary Cyber-Physical Systems Challenges*, R. Rajkumar and B. Krogh (organizers), at the *Workshop on Challenges for a Cyber-Physical Systems Community during the NSF Cyber-Physical Systems Information Day*, Arlington, VA, December 15, 2008
- *State-of-the-art simulations, models, tools and methods for representing and analyzing critical infrastructure*, Nabil R. Adam (organizer), *Science & Technology Directorate of a U.S. Department of Homeland Security workshop on Future Directions in Critical Infrastructure Modeling & Simulation*, Virginia Modeling, Analysis and Simulation Center (VMASC), Suffolk, Virginia, October 28-30, 2008
- *Real-Time and Non Real-Time Simulation Needs for Marine Applications, The Huntsville Simulation Conference 2004*, N. G. Hingorani and R. Crosbie (organizers), October 20, 2004
- *Modeling & Simulation Trends: Identifying Promising Contenders*, D. Gross, H. Sarjoughian, and W. Tucker (organizers), *Arizona State University*, Tempe, AZ, October 14, 2004

**KEYNOTE  
ADDRESSES**

- “A Changing Technology Landscape With Value Drivers for Modeling & Simulation,” *MODSIM World 2017*, Virginia Beach, Virginia, April 26-28, 2017
- “A Changing Technology Landscape With Value Drivers for Modeling & Simulation,” *2016 2017 Spring Simulation Multi-Conference (SpringSim'17)*, Virginia Beach, Virginia, April 23-26, 2017
- “Value Drivers in a Changing Landscape of Modeling & Simulation,” *2016 Summer Simulation Multi-Conference (SummerSim'16)*, Montreal, Quebec, Canada, July 24-27, 2016
- “Design of Behaviors that Bridge the Growing Function to Physics Divide,” *28<sup>th</sup> Euromicro Conference on Real-Time Systems (ECRTS16)*, Toulouse, France, July 5-8, 2016
- “Engineered System Design and Integration—a semantic domain for modeling cyber-physical systems,” *Forum on specification & Design Languages (FDL'13)*, Paris, France, September 24, 2013
- “System integration at the model level—a semantic domain for Cyber-Physical System modeling paradigms,” *Network for the Engineering of Complex Software-Intensive Systems for Automotive Systems (NECSIS) Workshop*, Montreal, Canada, June 18, 2013
- “Modeling Approximations of Computational Semantics for Cyber-Physical System Design,” *Challenge Workshop on Tools for Modelling, Simulation and Optimization (MSO) of Multiphysics Systems*, Berlin, Germany, September 24-26, 2012
- “Model Transformations and Testing in Model-Based Design of Cyber-Physical Systems,” *Verification and validation Of model Transformations (VOLT 2012) workshop at the Fifth International Conference on Software Testing, Verification and Validation (ICST 2012)*, Montréal, Canada, April 21, 2012
- “Analyzing Execution Semantics of High-level Formalisms for Modelling Hybrid Dynamic Systems,” *Hybrid Autonomous Systems (HAS 2012) workshop at the European Joint Conference on Theory & Practice of Software (ETAPS 2012)*, Tallinn, Estonia, 2012

- “Advancing Model-Based Design by Modeling Approximations of Computational Semantics,” *4<sup>th</sup> International Workshop on Equation-Based Object-Oriented Modeling Languages and Tools* (EOOLT 2011), Zürich, Switzerland, September 5, 2011
- “Opportunity in Embracing Imperfection: Is simulation the real thing?” *2011 Bellairs Computer Automated Multi-Paradigm Modeling* workshop (CAMPaM '11), Bellairs, Barbados, April 15-22, 2011
- “Embracing Opportunity in Imperfection: Is simulation the real thing?” *2011 Spring Simulation Multiconference* (SpringSim '11), Boston, MA, April 4-7, 2011
- “A Computational Semantics of Time-Based Models and Its Role in Model-Based Design,” *10th International Forum on Embedded MPSoC and Multicore* (MPSoC'10), Gifu city, Gifu, Japan, June 28 - July 2, 2010
- “Towards Computational Hybrid System Semantics for Block Diagrams,” *Ecole d'hiver Francophone sur les Technologies de Conception des Systèmes embarqués Hétérogènes* (FETCH 2010), Chamonix - Mont Blanc, France, January 11-13, 2010
- “Model-Based Design at an Enterprise Level: New directions in modeling and simulation research,” *The 48th Conference on Simulation and Modelling*, Göteborg (Särö), Sweden, October 29-31, 2007
- “Model-Based Design of Embedded Systems,” *2007 International Conference on Microelectronic Systems Education*, San Diego, CA, June 3, 2007
- “Hybrid Dynamic Systems in Control Design: Application to the Automotive Industry,” *11th Online World Conference on Soft Computing in Industrial Applications*, September 18 – October 6, 2006
- “Advanced Technologies to Accelerate Mixed Signal Simulation,” *17<sup>th</sup> IEEE International Workshop on Rapid System Prototyping*, Chania, Crete, June 13, 2006

**PLENARY PRESENTATIONS**

- “It is about time to consider physics in software systems,” *2012 Bellairs Computer Automated Multi-Paradigm Modeling* workshop (CAMPaM '12), Bellairs, Barbados, April 28 – May 5, 2012
- “A Model of Time to Characterize a Computational Framework for the Design of Cyber-Physical Systems,” *The 2<sup>nd</sup> International Symposium on Interdisciplinary Modelling of Cyber-Physical Systems* (IM-CPS 2011), Manchester, UK, May 25-27, 2011
- “Towards Computational Hybrid System Semantics for Time-Based Block Diagram Modeling,” *3<sup>rd</sup> IFAC Conference on Analysis and Design of Hybrid Systems* (ADHS'09), Zaragoza, Spain, September 16-18, 2009
- “Challenges and Solution Techniques for Hybrid Simulation: An Introduction,” *International Modeling and Simulation Multiconference 2007*, Buenos Aires, Argentina, February 8, 2007
- “Model-Based Design of a Power Window System: Modeling, Simulation, and Validation,” *International Conference on High Level Simulation Languages and Applications*, San Diego, CA, January 14, 2007
- “Computational Design Using MATLAB® and Simulink®,” *2nd Annual Computation Day*, the Pennsylvania State University, February 28, 2006
- “Advanced Technologies to Accelerate Mixed Signal Simulation,” *Canadian Workshop on System-on-Chip*, Ottawa, Ontario, Canada, October 12, 2005
- “Mode Transition Behavior in Hybrid Dynamic Systems,” *NWO Workshop Mathematical Modeling of Open Dynamical Systems Workshop*, Enschede, The Netherlands, September 21-23, 2000

**LECTURES AT INTERNATIONAL SCHOOLS**

- “Simulation Technologies for Hybrid Dynamic Systems,” *Dutch Institute of Systems and Control (DISC) Summer School on Modeling and Control of Hybrid Systems*, Eindhoven, Netherlands, June 26, 2003

“Mode Transition Behavior in Hybrid Dynamic Systems,” *Dutch Institute of Systems and Control (DISC) Summer School on Modeling and Control of Hybrid Systems*, Eindhoven, Netherlands, June 26, 2003

“Qualitative Bond Graphs for Fault Detection and Isolation Design,” 5<sup>th</sup> Vacation School of the *Network for Development and Applications of Methods for Actuator Diagnosis in Industrial Control Systems (DAMADICS) on Structural Analysis and Bond Graph*, Lille, France, April 10, 2003

## GUEST LECTURES

“Modeling complex engineered systems in industry using MATLAB and Simulink,” *University of Antwerp*, Antwerp, Belgium, December 16, 2016

“Computation in Model-Based Design for Cyber-Physical Systems,” *Zurich University of Applied Sciences*, Winterthur, Switzerland, September 7, 2011

“A Model of Time to Characterize a Computational Framework for the design of Cyber-Physical Systems,” *Eidgenössische Technische Hochschule Zürich*, Zürich, Switzerland, September 5, 2011

“Towards Computational Hybrid System Semantics for Time-Based Block Diagram Modeling,” *Polytechnique Montréal*, Montreal, Canada, March 22, 2010

“Hybrid Dynamic System Simulation Technologies,” *Universität Rostock*, Rostock, Germany, November 15, 2007

“An Overview of Hybrid Dynamic System Behaviors and Simulation Technology”

- *Universität Rostock*, Rostock, Germany, November 14, 2007

- *Ruhr-Universität Bochum*, Bochum, Germany, November 13, 2007

“Computational Models for the Design of a Power Window Control System,” *Georgia Institute of Technology*, Atlanta, GA, September 28, 2007

“Model-Based Design of Embedded Systems,” *University of Tennessee*, Knoxville, TN, September 27, 2007

“MATLAB® and Simulink® for Embedded System Design,” *IEEE FPGA-based Systems Engineering: Chip-scale to the Global-scale* course, Woburn, MA, May 9, 2007

“Mode Transition Behavior in Hybrid Dynamic Systems,” *Distinguished Lecturer in the Spring 2007 Lecture Series* at the Electrical Engineering and Computer Science Department, *Vanderbilt University*, March 29, 2007

“Computer Automated Multi-Paradigm Modeling,” Computer Science and Engineering Department, *Arizona State University*, AZ, October 15, 2004

## TUTORIALS

“Graphical Syntactic Extensions of Haskell for Block Diagrams,” workshop of the Object Management Group (OMG) on *Precise Behavioral Semantics for Domain Specific Modeling Languages*, Jacksonville, Florida, September 25, 2007

“MATLAB® and Simulink® for Embedded System Design,” *Design, Automation and Test in Europe* Conference & Exhibition, “Simulink® for Design and Programming Multiprocessor SoC” tutorial, Nice, France, April 16, 2007

“Model-Based Design—An overview and research,” *Quantitative Aspects of Embedded Systems* Dagstuhl Seminar, B. Haverkort, J.-P. Katoen, and L. Thiele (organizers), Dagstuhl, Germany, March 7, 2007

“Simulink®—An Introduction to the Technology,” *International Conference on Modeling and Simulation—Methodology, Tools, Software Applications (M&S-MTSA'06)*, Calgary, Canada, August 1, 2006

“Issues in Advanced Mixed-Signal Simulation,” *43rd Design Automation Conference*, “Tools for Hybrid Embedded Systems: Modeling, Verification, and Design” tutorial, San Francisco, California, July 28, 2006

## SEMINARS

- “Exploring Cyber-Physical Systems in Smart Emergency Response,” School of Computer Science Colloquium, *McGill University*, Montreal, Canada, September 19, 2014
- “Principles of Engineered System Design and Challenges for Cyber-Physical Systems,” Center for Information & Systems Engineering Seminar, *Boston University*, Boston, MA, October 25, 2013
- “Executing models in less time—some solver insight,”
- *MathWorks Seminar*, Greifensee, Switzerland, September 8, 2011
  - *MathWorks Seminar*, Turgi, Switzerland, September 6, 2011
- “Towards Computational Hybrid System Semantics for Time-Based Block Diagram Modeling,” School of Computer Science Colloquium, *McGill University*, Montreal, Canada, March 19, 2010
- “Towards Computational Hybrid System Semantics for Block Diagrams,” *Technische Universität München*, Munich, Germany, September 23, 2009
- “Engineering cyber-physical systems: a strategic outlook,” *United Technologies Research Center (UTRC)*, East Hartford, CT, August 13, 2008
- “Computational Models for the Design of a Power Window Control System,” *Seoul National University*, Seoul, South Korea, July 9, 2008
- “Model-Based Design—What it is and what it still needs,”
- *National Tsing Hua University*, Hsinchu, Taiwan, July 15, 2008
  - *Yeungnam University*, Gyeongsan, South Korea, July 10, 2008
  - *National University of Defense Technology*, Changsha, China, July 2, 2008
  - *United Nations University*, Macau, June 30, 2008
  - *Shantou University*, Shantou, China, June 26, 2008
  - *Tsinghua University*, Beijing, China, June 23, 2008
- “Model-Based Design of a Power Window System: Modeling, Simulation, and Validation”
- *Massachusetts Institute of Technology*, Independent Activity Period (IAP), Cambridge, MA, January 19, 2007
  - CHESS Seminar, *University of California, Berkeley*, Berkeley, CA, April 8, 2008
- “Simulink®—An Introduction to the Technology,” *Grenoble Institute of Technology (INPG)*, Grenoble, France, January 10, 2008
- “Advanced Technologies to Accelerate Mixed Signal Simulation,” *Verification and Simulation of Dynamic Systems* Dagstuhl seminar, C. Priami, H. R. Nielson, D. Nicol, H. Ruess, and A. Uhrmacher (organizers), Dagstuhl, Germany, April 18, 2006
- “An Industrial Embedded Control System Design Process,” Embedded Systems Group seminar, Department of Systems and Computer Engineering, *Carleton University*, Ottawa, ON, Canada, October 13, 2005
- “MATLAB®/Simulink® in Mechanical Engineering,” Mechanical Engineering Department, *University of Aveiro*, Aveiro, Portugal, November 29, 2004
- “Mode Transition Behavior in Hybrid Dynamic Systems,”
- Center for Hybrid and Embedded Software Systems (CHESS) seminar, Department of Electrical Engineering and Computer Sciences, *University of California, Berkeley*, Berkeley, August 16, 2005
  - Department of Biochemical and Chemical Engineering, *University of Dortmund*, Dortmund, Germany, December 1, 2004
  - Laboratory for Analysis and Architecture of Systems, *Centre National de la Recherche Scientifique*, Toulouse, France, January 24, 2003
  - Computer Science Department, *McGill University*, Montreal, Canada, May 27, 2002
  - Department of Chemical Engineering, *Massachusetts Institute of Technology*, MA, April 18, 2002
- “Multi-formalism Modeling and Simulation Using MATLAB®/Simulink®,” Computer Science Department, *McGill University*, Montreal, Canada, September 17, 2004

“On Multi-Paradigm Modeling,” *Grand Challenges for Modeling and Simulation* Dagstuhl seminar, R. Fujimoto, D. Lunceford, E. Page, and A Uhrmacher (organizers), Dagstuhl, Germany, August 29, 2002

“Model-Based Design of a Power Window System: Modeling, Simulation, and Validation,”  
- *The MathWorks Seminar*, Indiana, IN, August 15, 2002  
- *The MathWorks Seminar*, Novi, MI, August 13, 2002

“Simulink® Power Window Controller Specification,”  
- *The MathWorks Seminar*, Troy, MI, February 14, 2002  
- *The MathWorks Seminar*, Novi, MI, February 12, 2002

“Hybrid Bond Graphs,” Electrical Engineering Department, *Technical University Twente*, Enschede, Netherlands, 2001

“Qualitative Model Based Diagnosis of Abrupt Faults,” Institute of Control Engineering, *Technical University of Hamburg-Harburg*, Hamburg-Harburg, Germany, 2001

“Modeling Discontinuities in Physical System Behavior: A hybrid bond graph approach,”  
- Computer Science Department, *Vanderbilt University*, Nashville, TN, 1996  
- *Hewlett-Packard Labs*, Palo Alto, CA, 1996

**INVITED TALKS** “Model-based Design for Controls, AI, and Communications in Intelligent Systems,” *Design, Automation and Test in Europe (DATE 2019)*, industry presentation, I. Sander and S. Stuijk (Chairs), Florence, Italy, March 28, 2019

“Safety in Freely-Composed Cyber-Physical Systems—Challenges and Opportunities,” with A. Rajhans, *Exploring the Dimensions of Trustworthiness: Challenges and Opportunities Workshop*, E. Griffor (Program Chair), National Institute of Standards and Technology (NIST), Gaithersburg, MD, August 30, 2016

“Cyber-Physical System Ensembles: Analyzing Needs and Enabling Opportunity,” *Cyber-Physical Systems Week (CPS Week 2016)*, R. Grosu and T. A. Henzinger (General Chairs), Vienna, Austria, April 12, 2016

“Requirements Based Model Complexity Selection,” with Z. Jiang, Software Certification Consortium Meeting #16: *Necessary and Sufficient Safety Assurance Evidence*, A. Wasssyng (Program Chair), Philadelphia, PA, January 11, 2016

“Smart emergency response: cyber-physical system opportunities, needs, and directions,” with J. Zander, T. Padir, Y. Wan, and S. Fu, *NSF Expeditions in Augmented Program Engineering (ExCAPE) Annual Meeting*, R. Alur (Program Chair), Cambridge, MA, June 21, 2015”

“A Heterogeneous Fleet of Vehicles for Automated Humanitarian Missions,” with E. Bilgin (presenter), D. Escobar Sanabria, K. Zhang, and J. Zander, *INFORMS Annual Meeting (Bridging Data and Decisions)*, C. A. Yano (General Chair), San Francisco, CA, November 12, 2014

“Model-Based Design and Medical Devices,” *The Pacemaker Challenge: Developing Certifiable Medical Devices* Dagstuhl Seminar, D. Méry, B. Schätz, A. Wasssyng (organizers), Dagstuhl, Germany, February 5, 2014

“Heterogeneous Function Composition in Embedded Software Synthesis to Eliminate Direct Relations Between Components,” *2013 Workshop on Software Synthesis (WSS)* at the *Embedded Systems Week*, Montreal, Canada, October 4, 2013

“Implications and challenges of opening up the embedded world to cyber-physical systems,” *19<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)* Industrial Session, Philadelphia, PA, April 10, 2013

“Verification of Stiff Hybrid Systems by Modeling the Approximations of Computational Semantics,” *Workshop on System Design meets Equation-based Languages*, Lund, Sweden, September 19-21, 2012

“Approximating physics in the design of technical systems,” *Architecture-Driven Semantic Analysis of Embedded Systems* Dagstuhl Seminar, P. Feiler, J. Hugues, O. Sokolsky (organizers), Dagstuhl, Germany, July 3, 2012



- “Putting the physics in the design of Cyber-Physical Systems,” *Science and Engineering of Cyber-Physical Systems* Dagstuhl Seminar, H. Giese, B. Rumpe, B. Schätz, and J. Sztipanovits (organizers), Dagstuhl, Germany, November 2, 2011
- “Heterogeneous Function Composition to Eliminate a Class of Direct Relationships in Software Components of Dynamic Systems,” ArtistDesign workshop on *Foundations and Applications of Component-based Design* (WFCD), Scottsdale, AZ, October 24, 2010
- “On Computational Semantics as a Precise Foundation of an Industrial Toolchain for Analysis and Design of Multi-domain Systems,” 6<sup>th</sup> User Committee meeting of the Innovative Research Program (IOP) *Software Generation*, MathWorks, Eindhoven, Netherlands, October 7, 2010
- “Computation of Things: Challenges and Solutions for the Needs of Humanity” with J. Zander, *H+ Summit @ Harvard—Rise of the Citizen-Scientist*, D. Orban (organizer), Cambridge, MA, June 13, 2010
- “Data Needs in Computational Modeling and Simulation—An Industry Perspective,” introduction to a plenary industry panel at the *US Department of Homeland Security* workshop on *Grand Challenges in Modeling, Simulation, and Analysis for Homeland Security*, Arlington, VA, March 17, 2010
- “Software Synthesis for Control System Algorithms in Industrial Applications,” *Model Driven Development for Safe and Dependable Embedded Systems—Solutions, requirements and experiences in the MathWorks and OMG Worlds* workshop, S. Mazzini (organizer), Pisa, Italy, September 21, 2009
- “Model-Based Design of Cyber-Physical Systems,” panel on *Cross-Disciplinary Cyber-Physical Systems Challenges*, R. Rajkumar and B. Krogh (organizers), at the *Workshop on Challenges for a Cyber-Physical Systems Community* during the *NSF Cyber-Physical Systems Information Day*, Arlington, VA, December 15, 2008
- “Modeling Cross-domain Cascading Infrastructure Effects—a View,” panel on *State-of-the-art simulations, models, tools and methods for representing and analyzing critical infrastructure*, Nabil R. Adam (organizer), *Science & Technology Directorate* of the *U.S. Department of Homeland Security* workshop on *Future Directions in Critical Infrastructure Modeling & Simulation*, Virginia Modeling, Analysis and Simulation Center (VMASC), Suffolk, Virginia, October 29, 2008
- “A Cyber-Physical Systems Perspective,” *1<sup>st</sup> Workshop on Cyber-Physical Systems: Closing the Loop* during the *Embedded Systems Week*, Atlanta, Georgia, October 23, 2008, *invited talk*
- “Model-Based Design—Unpolished,” *Software Engineering for Self-Adaptive Systems* Dagstuhl seminar, B. H. C. Cheng, R. de Lemos, H. Giese, P. Inverardi, and J. Magee (organizers), Dagstuhl, Germany, January 17, 2008
- “Model-Based Design of Embedded Systems,” *Quantitative Aspects of Embedded Systems* Dagstuhl seminar, B. Haverkort, J.-P. Katoen, and L. Thiele (organizers), Dagstuhl, Germany, March 5, 2007
- “Challenges and Solution Techniques for Hybrid Simulation: Introduction,” panel on *Challenges and Solution Techniques for Hybrid Simulation*, *43<sup>rd</sup> IEEE Conference on Decision and Control*, P. J. Mosterman and M. Clune (organizers), December 14, 2004
- “Using Simulink® in Marine Applications,” panel on *Real-Time and Non Real-Time Simulation Needs for Marine Applications*, *The Huntsville Simulation Conference 2004*, N. G. Hingorani and R. Crosbie (organizers), October 20, 2004
- “Computer Automated Multi-Paradigm Modeling: Simulation as an operation on models,” invited workshop on *Modeling & Simulation Trends: Identifying Promising Contenders*, D. Gross, H. Sarjoughian, and W. Tucker (organizers), *Arizona State University*, Tempe, AZ, October 14, 2004
- “Simulink® Power Window Controller Specification,” invited workshop on *Computer Automated Multi-paradigm Modeling*, P. J. Mosterman and H. Vangheluwe (organizers), McGill University’s Bellairs campus, Barbados, April 27, 2004

**AWARDED  
PATENTS**

- R. Vompolu, I. Garcia, G. Thomas, P. Cox, E. Mestchian, and P. J. Mosterman, **Determining functional equivalence of configurations of a model**, US Patent #10,275,227, April 30, 2019
- S. Avadhanula, P. J. Mosterman, and E. Mestchian, **Defining attributes of variables in a state chart of a technical computing environment**, US Patent #10,235,140, March 19, 2019
- N. E. Brewton, J.-Y. Brunel, A. Moore, and P. J. Mosterman, **Modeling a physical component interface in a unified modeling language model**, US Patent #10,181,059, January 15, 2019
- X. Long, J. Zander, D. Koh, G. K. Vallabha, and P. J. Mosterman, **Exchanging information among system middleware and models**, US Patent #10,116,500, October 30, 2018
- S. Avadhanula, P. J. Mosterman, and E. Mestchian, **Implicit event broadcast in a state chart of a technical computing environment**, US Patent #10,055,203, August 21, 2018
- P. J. Mosterman, M. J. Simoneau, E. W. Gulley, J. R. Torgerson, A. C. Grace, **Enriched video for a technical computing environment**, US Patent #9,729,843, August 8, 2017
- J. Bienkowski, P. J. Mosterman, I. Noell, and D. A. McGraw, **Analyzing information associated with logic**, US Patent #9,678,718, June 13, 2017
- P. J. Mosterman, P. S. Szpak, J. R. Torgerson, D. F. Higgins, and P. F. Kinnucan, **Generic human machine interface for a graphical model**, US Patent #9,672,389, June 6, 2017
- J. E. Ciolfi, P. J. Mosterman, J. R. Torgerson, D. F. Higgins, P. F. Kinnucan, **Linking of model elements to spatial elements**, US Patent #9,607,113, March 28, 2017
- D. P. Orofino, P. J. Mosterman, and D. Koh, **Using abstract nodes to test the behavior of a dynamic system**, US Patent #9,594,854, March 14, 2017
- P. J. Mosterman, E. Mestchian, J. R. Torgerson, D. F. Higgins, and P. F. Kinnucan, **Interacting with a model via a three-dimensional (3D) spatial environment**, US Patent #9,582,933, February 28, 2017
- M. J. Englehart, Z. Han, and P. J. Mosterman, **Determining conditions associated with accessing data stores**, US Patent #9,582,768, February 28, 2017
- M. Kachmar, D. Koh, P. J. Mosterman, and M. Belge, **Modifying models based on profiling information**, US Patent #9,569,179, February 14, 2017
- T. Gaudette and P. J. Mosterman, **Systems and methods using models to evaluate physical components**, US Patent #9,547,746, January 17, 2017
- S. Avadhanula, P. J. Mosterman, and E. Mestchian, **Textual code provided in temporal and change operators of a technical computing environment**, US Patent #9,547,481, January 17, 2017
- A. J. Moore, E. M. Mestchian, and P. J. Mosterman, **Systems and methods for generating message sequence diagrams from graphical programs**, US Patent #9,547,423, January 17, 2017
- P. J. Mosterman, **Managing an application variable using variable attributes**, US Patent #9,542,164, January 10, 2017
- P. J. Mosterman, S. Parupati, A. A. Desai, A. Uthama, and M. J. Quinn, **Multimodal input processing**, US Patent #9,530,102, December 27, 2016
- S. Avadhanula, P. J. Mosterman, and E. Mestchian, **Graphical function specialization**, US Patent #9,513,880, December 6, 2016
- S. Avadhanula, P. J. Mosterman, and E. Mestchian, **Time-based operations via textual code in a technical computing environment**, US Patent #9,507,572, November 29, 2016
- K. M. Popovici, P. J. Mosterman, B. K. Ogilvie, R. Ghosh-Roy, A. C. Leon, and J. D. Macdonald, **Unified hardware and software debugging**, US Patent #9,489,283, November 8, 2016
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