Proceedings of the Symposium on Theory of Modeling and Simulation - DEVS Integrative M&S Symposium

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SYMPOSIUM ON THEORY OF MODELING & SIMULATION – DEVS INTEGRATIVE M&S SYMPOSIUM (DEVS 2013)

Simulation Series Volume 45 Number 4

EDITORS:
Gabriel A. Wainer
Pieter Mosterman
Gregory Zacharewicz
Fernando Barros

Welcome from the SpringSim'13 General Chair

Welcome to the Spring Simulation Multi-Conference 2013 (SpringSim'13) in San Diego, CA. As the General Chair of this year's SpringSim, it is an honor and privilege to be your host for these exciting four days of activities driven and organized by the various members of our society. Despite challenges in the worldwide economy and the overall decrease of funding for travel and conferences, the interest in Modeling and Simulation (M&S) and its applications is still high enough to ensure a challenging and interesting program. From the opening tutorial day where international experts are providing their knowledge to our community to the presentation of peer-reviewed papers, invited special topic presentations, and expert panel discussions the chairs of our symposia did their best to provide an outstanding choice. Without the work of these volunteers, SpringSim would not have been possible.

This year's SpringSim is again collocated with the Spring Simulation Interoperability Workshop organized by the Simulation Interoperability Standards Organization (SISO). We hope that you will find the time to visit some of their events as well. Of particular interest should be the NASA Smackdown event on Tuesday evening. During this event, students present their work on utilizing simulation interoperability solution to contribute to a bigger NASA effort. SCS encourages students to participate in this event and hopes to play a more active role in the future.

Before addressing the symposia in some more detail, please allow me to introduce the organization committee for this year's event:

- Vice-General Chair: Mamadou Traoré, Blaise Pascal University LIMOS
- Program Chair: Saikou Diallo, Old Dominion University
- Proceedings Chair: Andrea D'Ambrogio, University of Rome
- Awards Chair: Agostino Bruzzone, University of Genoa DIPTEM
- Tutorial Chair: Daniele Gianni, University of Rome
- Poster Co-Chairs: Shafagh Jafer, Milwaukee School of Engineering
  Mohammad Moallemi, Carleton University

I wish to thank every one of these leaders in the M&S Community for giving their time and expertise to support the overall organization of SpringSim. Their tireless effort tied the individual efforts of the symposia together to become SpringSim, which makes this a leading event in the M&S community.

The living components of SpringSim, however, are our symposia. Each of them will address you in their own section as well, but I want to use the opportunity to thank all the co-chairs that organized outstanding programs within their domains, and who showed great team spirit in being flexible in the scheduling and very creative when it came to organizing shared sessions of common interest. Some of them even integrate SISO activities to overall serve our community better. The symposia organized under the roof of SpringSim are this year:

- Agent-Directed Simulation (ADS) Symposium, chaired by Levent Yilmaz, Auburn University, and Tuncer Ören, University of Ottawa
- 46th Annual Simulation Symposium (ANSS), chaired by Eric Imsand, GaN Corporation, and Shaoen Wu, University of Southern Mississippi
- 16th Communications and Networking Symposium (CNS), chaired by Hassan Rajaei, Bowling Green State University
- Symposium on Emerging M&S Applications in Industry and Academia (EAIA), chaired by Rafael Diaz, Old Dominion University, and Francesco Longo, University of Calabria
- 21th High Performance Computing Symposium (HPC), chaired by Fang (Cherry) Liu, Georgia Tech, and Karl Rupp, Technische Universität Wien / Argonne National Laboratory
- Symposium on Military Modeling & Simulation (MMS), chaired by Saikou Diallo, Old Dominion University, and Kevin Gupton, University of Texas at Austin
- Symposium on Simulation for Architecture and Urban Design (SimAUD), chaired by Liam O'Brian, Carleton University, and Azam Khan, Autodesk
- ***New Mini-Symposium*** on Modeling and the Humanities (MatH), chaired by Charles Turnitsa, Columbus State University, and Ted Carmichael, University of North Carolina

I am also very happy that the Conference on Theory of Modeling and Simulation (TMS'13), chaired by Gabriel A. Wainer, Carleton University, and Pieter Mosterman, McGill University, will be conducted as a sub-conference under the SpringSim roof.

I hope that many of our symposia are continuing to grow and become sub-conferences following the example of TMS. I also hope that we will continue to attract new domains, such as MatH and the track on Philosophy of M&S in EAIA.

Finally, SpringSim would not have been made possible without the authors and presenters. Rigorous peer reviews added to the already high standards of this year's submissions that we received from all over the world. The academic program is rounded up perfectly by our industry sponsors. I encourage everybody to visit them during their exhibition.

My final thank you in this welcome note goes to the office of SCS. Oletha Darensburg and her team made sure that all deadlines were on schedule, production documents were in place, and that everyone continued to be in a cheerful mode while doing so.

I wish you a great time during the SpringSim 2013!

Andreas Tolk
General Chair SpringSim 2013
Professor Engineering Management and Systems Engineering
Professor Modeling, Simulation, and Visualization Engineering
Old Dominion University, Norfolk, VA

TMS'13 CHAIRS' MESSAGE

On behalf of the Organizing Committee, we are delighted to welcome you to the 2013 Symposium on Theory of Modeling and Simulation (formerly known as the DEVS Symposium). The purpose of TMS (DEVS)'13 is to provide a forum to discuss most recent advancements in Theory of Modeling and Simulation. The main focus is on theory of modeling, methodology, practice and M&S software, as well as lessons learned and challenges. The Symposium focuses also on bridging different areas in the field of Theory of Modeling and Simulation, including formal modeling, graph transformation, model-checking, model-driven engineering, modeling methodologies and software. The program includes a wide selection of technical presentations and speakers, and a collection of state-of-the-art presentations and articles related to research, development, and applications of Theory of Modeling and Simulation. This year the conference is hosting the third edition of the Mod4Sim workshop (chaired by Andrea D'Ambrogio, University of Rome "Tor Vergata", and Daniele Gianni, European Space Agency), which focuses on model-driven approaches for simulation engineering.

The conference and workshop committees received 74 submissions altogether, of which, 20 were accepted as full papers and 14 were accepted as work-in-progress papers. The articles have been peer reviewed by two or more experts and are grouped into 14 technical sessions.

This year the conference is hosting the Second DEVS Modeling and Simulation Ph.D. Dissertation Award, created in order to recognize and reward the best Ph.D. thesis related to the DEVS formalism.

The Awards Committee chose the conference Best Paper based on the reviewer's evaluations. Based on this information, the Awards Committee has met and decided on the Best Paper Award, which will be announced during the Conference and posted in the Symposium webpage.

We extend our gratitude to the Symposium Steering Committee members, Technical Program Committee Members, Session Chairs, to all authors for their invaluable contributions, effort, and time. We sincerely express our appreciation to the numerous technical reviewers and the various Review Committees for their thorough work (which includes over 158 reviews), making the Conference Proceedings a high quality document. The efforts, diligence, and thoroughness of the reviewers and Review Committees are gratefully acknowledged.

Finally, we look forward to seeing you again in TMS'14.

On behalf of the TMS Conference Committee and the Society for Modeling and Simulation International, we welcome you to San Diego, and we very much hope you enjoy the conference.

Sincerely,

Gabriel A. Wainer   **Pieter Mosterman**
General Chair   General Co-Chair

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Mod4Sim Workshop

Workshop Chairs: Andrea D'Ambrogio, University of Rome "Tor Vergata", Italy; Daniele Gianni, European Space Agency, The Netherlands

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