

Wednesday, December 4, 2013– Industrial and Societal Challenge/Poster Workshop

The first day in the Amphitheater Adenauer is dedicated to the presentation societal & industrial challenges in the field of the complex systems engineering. It consists of a number of high-profile invited seminars who give to the participants a clear and synthetic vision of the domain and of its themes. A poster session blends then into the conference cocktail in Salon Honnorat.

- **09:00-09:30 - Opening of the conference**

- 09:00-09:05: Welcoming by the conference general chair Daniel Krob, CESAMES & Ecole Polytechnique and by the Organizing Committee Chair Marc Aiguier, Ecole Centrale de Paris - France
- 09:05-09:10: Welcoming by the Program Committee co-chairs Frédéric Boulanger, Supélec and Clotilde Marchal, EADS - France
- 09:10-09:20: Welcoming by Gérard Poirier, president of Group “Tools of Systems Design & Development” Systematic Paris-Region - France
- 09:20-09:30: Welcoming by Eric Perrin-Pelletier, general director of the Institut de Recherche Technologique SystemX - France

- **09:30-12:45 - Societal Challenges**

- 09:30-09:35: Introduction by the session chairman
- 09:35-10:10: Eco-system: *Large Scale Systems of the Singapore Nation*, Pao-Chuen Lui, National University of Singapore - Singapore
- 10:10-10:45: Politics & Economy: *Eco-systemic Design for Economical Development's Governance*, Claude Feliot, Conseil Régional de Martinique - France
- 10:45-11:05: Coffee break
- 11:05-11:40: Intelligent Transportation: *Intelligent Multimodal Mobility*, Jean-François Janin, French Ministry of Sustainable Development - France
- 11:40-12:15: Air Traffic Management: *Behaving nicely in a Systems of Systems - Harmonizing with the Environment*, Michael Henshaw, University of Loughborough - Great Britain
- 12:15-12:45: Panel discussion

- **12:45-14:00 - Lunch at Salon Honnorat**

- **14:00-17:30 – Industrial Challenges**

- 14:00-14:05: Introduction by the session chairman
- 14:05-14:40: *Urban Transportation: What Systemic Levers Can Improve the Rolling Stocks Performance in the Great Paris Area?*, Emmanuel Teboul, SNCF - France
- 14:40-15:15: *Border Security: the System of Systems Perspective (EADS/CASSIDIAN return of experience)*, Pascal Pezzani, Cassidian - France
- 15:15-15:50: Naval Systems: *The Virtual Ship*, Alain Bovis, DCNS - France
- 15:50-16:20: Coffee break

- 16:20-16:55: *Satellite Constellation: Iridium NEXT, a Global Satellites Constellation Based Network for Mobile Communications*, Isabelle Buret, Thales TAS - France
- 16:55-17:30: Panel discussion "Optimization across Stakeholders / Specialties in Large Complex Systems"
- **17:30-19:00 - Poster Workshop & Conference Cocktail** (*Salon Honnorat*)
 - Make your own System Engineering workbench, Mélanie Bats (Obeo – France)
 - Methodology for Determining Stakeholders' Criteria Weights in Systems Engineering, Vikas Shukla and Guillaume Auriol (LAAS-CNRS; INSA Toulouse - France)
 - The Missing Link - between Requirements and Design, Armin Hasse (Siemens AG - Germany) and Cees Michielsen (Requirements and Design Studio B.V. - Netherlands)
 - Model-based Specification of safety-critical Rail Systems, Randolf Berglehner (DB Netze AG - Germany) and Andreas Korff (Atego Systems GmbH - Germany)
 - ARCADIA: Model-Based Collaboration for System, Software and Hardware Engineering, Stephane Bonnet and Jean-Luc Voirin (Thales - France)
 - Dependency Graph for Requirements Structuring based on Guidance Ontology, Nesrine Darragi, Philippe Bon, Simon Collart-Dutilleul and El-Miloudi El-Koursi (Ifsttar – France)
 - Agile stylized approach to manage complex project, Mikhail Belov (IBS - Russia)
 - Simulation for all components, phases and life-cycles of complex space systems, Fernand Quartier (Spacebel – Belgium) and Frederic Manon (CNES - France)
 - Model-Based Interchange Formats: a Generic Set of Tools for Validating Structured Data against a Knowledge Base, Olivier Rosec and Pascal Rivière (CNAV – France)
 - Global Safety Management Method in Complex System Engineering, Romaric Guillerm (LAAS – France), Hamid Demmou (LAAS/CNRS – France) and Nabil Sadou (Supélec/IETR – France)
 - Runtime Fault Prediction and Prevention for Emerging Services in System of Systems, Imad Sanduka, Tim Lochow (EADS Innovation Works – Germany) and Roman Obermaisser (Universität Siegen – Germany)
 - Managing Complexity in Requirement Elicitation, Abd-El-Kader Sahraoui (LAAS/CNRS – France)
 - Efficiency Gains Related to Chemical Treatments in Oilfield Production - Resulting from Applying Systems Architecture, Alan Krauss (Schneider Electric - USA)
 - Concurrent system engineering in Air Traffic Management: steering the SESAR program, André Ayoun, Gianni Inzerillo (EADS – France), Benoit Fonck and Alfredo Gomez (SESAR Joint Undertaking - Belgium)
 - A Model Based Assessment of the Solution Space of Cognitive Products, Thierry Sop Njindam and Kristin Paetzold (University Bundeswehr München – Germany), Torsten Metzler and Udo Lindemann (Technical University München - Germany)
 - Proposition of a guide for investigating, modeling and analyzing system operating modes: OMAG, Vincent Chapurlat and Nicolas Daclin (Ecole des Mines d'Alès – France)

- Reinventing Goal-Based Requirements Modeling, Vikas Shukla and Guillaume Auriol (LAAS-CNRS; INSA Toulouse - France)
- A different view on system decomposition __ subsystem-centered property evaluation in multiple supersystems, Arne Herberg and Udo Lindemann (Technische Universität München - Germany)
- Requirements Modeling and Automated Requirements-Based Test Generation, Jon Friedman and John Lee (The MathWorks - France)
- The Body of Knowledge and Curriculum to Advance Systems Engineering (BKCASE) Project, Jean-Claude Roussel (EADS Innovation Works - France), Garry Roedler (Lockheed Martin Corp. - USA) and Timothy Ferris (University of South Australia - Australia)
- Modeling sustainable recycling logistic network for batteries from electric vehicles in EU-27: A system dynamics approach, Hakim Idjis and Asma Ghaffari (Ecole Centrale Paris - France)
- Synchronize MBSE studies in a context of high diversity, Philippe Toussaint and Joe Matta (Knowledge Inside - France)
- Sirius: Creation of Custom Modeling Workbenches Made Easy, Stephane Bonnet (Thales - France) and Etienne Juliot (Obeo - France)
- Systems engineering and modeling: some epistemological remarks, Fabio Roda (Ecole Polytechnique - France)
- Towards a formal language for systemic requirements, Yann Hourdel (Ecole Polytechnique - France)
- A model-based method to support complex system design via systems interactions analysis: transition from systems engineering to behavioural models, Fabien Retho and Hichem Smaoui (EADS Innovation Works - France), Jean-Claude Vannier and Philippe Dessante (Supélec - France)

Thursday, December 5, 2013 - Towards a theory of systems / Systems Architecture & Engineering Tools Session

The second day of the conference in the Amphitheater Adenauer is devoted to systemic methodologies and fundamentals emerging from academic as well as industrial environments. It is centered on the fact that the architectural paradigm can help to think about complex systems in a unified way. The conference visit & dinner will end the day.

- **09:00-12:40 - Scientific state of the art and Systems Architecture & Engineering Tools Session Part 1**
 - 09:00-09:05: Introduction by the session chairman
 - 09:05-09:40: SoS Theory: *Strengthening the Foundations for Model-based Engineering for Systems of Systems*, John Fitzgerald, Newcastle University - Great Britain
 - 09:40-10:15: SoS modelling: *Systems of Systems Modeling*, Edward Lee, Berkeley University - USA
 - 10:15-10:50: SoS Behaviors: *Self-reflection and a Version of Structured "Playing" may be Critical for the Verification and Validation of Complex Systems of Systems*, Kirstie Bellman, Aerospace Corp. - USA

- 10:50-11:15 - Coffee break
- 11:15-11:50: SoS Simuling: *The Complexity Experience: An Introduction to Modeling and Simulation of Complex Systems*, Michel Morvan, The CosMo Company - France
- 11:50-12:40: Systems Architecture & Engineering Tools Session - Success stories
- **12:40-14:00 Lunch at Salon Honnorat**
- **14:00-18:10- Methodological state of the art and Systems Architecture & Engineering Tools Session Part 2**
 - 14:00-14:05: Presentation of the session chair
 - 14:05-14:40: INCOSE SoS Vision: *A Systems Engineering View of Systems of Systems*, Judith Dahmann, Mitre Corp. - USA
 - 14:40-15:15: SoS Architecture: *SoS and Large-Scale Complex Systems Architecture*, Dominique Luzeaux, Direction Générale de l'Armement - France
 - 15:15-16:05: Architecture & Engineering Tools Session - Success stories
 - 16:05-17:00: Architecture & Engineering Tools Session - Booths visit & Coffee/tea
 - 17:00-17:35: SoS Design: *Current Research Projects*, Eric Honour, INCOSE - USA
 - 17:35-18:10: System Engineering Overview, *Journey from Adolescence to Adulthood: Systems Engineering 1994-2014*, Olivier De Weck, MIT - USA
- **19:00-22:30 - Conference Visit & Dinner**
 - 19:00 - 20:00 - Visit with guides: departures at 19:00 and 19:10 or free visit with audio guide from 19:00 / Location of the Visit: Musée des Arts décoratifs, 107 rue de Rivoli 75001 Paris
 - 20:00 - 22:30: Conference Dinner / Location: Restaurant le Saut du Loup, 107 rue de Rivoli 75001 Paris

Friday, December 6, 2013 – Contributed Talks, Tutorials and Workshop

The third and last conference day is dedicated to 2 parallel contributed talks sessions as well as to 1 workshop and 3 tutorials. The contributed talks are open to every CSD&M participants who can choose each presentation they wish to attend. However, tutorials are chargeable options and the workshop is reserved to persons invited by Systematic Paris-Region. A farewell ceremony will end the conference and best papers awards will be announced at this moment by Daniel Krob, general chair of the CSD&M 2013.

- **9:30-10:00 - Challenges and Solutions for Model Based Systems Engineering, the AGeSYS project:** Eric Bantegnie, Esterel Technologies - France
 - 10:00-10:30 - Questions & Responses
 - 10:30-11:00 - Coffee break and Taking place in Salon of your choice or registration
- **10:00-17:30 - Parallel sessions - "A la carte" Program: contributed talks, tutorials or workshop**
Contributed Talks - 2 parallel sessions accessible to all the CSD&M participants

10:30-17:30 - Parallel Session 1 (Salon Gulbenkian)

Session 1.1 - System Analysis – Session Chair: Nicolas Treves

- 10:30-11:00 - The Multidimensional Hierarchically Integrated Framework for Modeling Complex Engineering Systems, Ahmad Alabdulkareem, Anas Alfaris, Vivek Sakhrani, Adnan Alsaati and Olivier de Weck (MIT - USA)

- 11:00-11:30 - Simulation Methods in the Healthcare Systems, Andrey Khudyakov, Camille Jean, Marija Jankovic, Julie Le Cardinal and Jean-Claude Bocquet (Ecole Centrale Paris - France)
- 11:30-12:00 - A method for managing uncertainty levels in design variables during complex product development, João Fernandes, Elsa Henriques and Arlindo Silva (Instituto Superior Técnico-Utl - Portugal)
- 12:00 -12:30 - Re-Using SysML System Architectures, Adreas Korff (Atego - France)

- **12:30-14:00: lunch at Salon Honnorat**

Session 1.2 - MBSE

- 14:00-14:30 - Handling Complexity in System of Systems Projects - Lessons Learned from MBSE Efforts in Border Security Projects, Emrah Asan (EADS Deutschland GmbH - Germany), Oliver Albrecht (BMW - Germany) and Semih Bilgen (Middle East Technical University - Turkey)
- 14:30-15:00 - Capturing variability in Model Based Systems Engineering, Cosmin Dumitrescu (Université Paris I - France), Patrick Tessier (CEA - France), Camille Salinesi (CRI-Université Paris I - France), Sebastien Gerard (CEA-List - France), Alain Dauron (Renault - France) and Raul Mazo (Université Paris I - France)
- 15:00-15:30 - Application of an MBSE approach for the integration of multidisciplinary design processes, Nicolas Albarello (EADS Innovation Works - France) and Hongman Kim (Phoenix Integration - USA)
- 15:30-16:00 – Coffee Break

Session 1.3 – MBSE

- 16:00-16:30 - A Hybrid Event-B Study of Lane Centering, Richard Banach (University of Manchester – UK) and Michael Butler (University of Southampton – UK)
- 16:30-17:00 - A Visual Logic for the Description of Highway Traffic Scenarios, Stephanie Kemper and Christoph Etzien (OFFIS, Institut für Informatik - Germany)
- 17:00-17:30 - Early Stage Verification and Validation of Cyber-Physical Systems through Requirements Driven Probabilistic Certificate of Correctness Metric, David Fox (Dassault Systemes Americas Corp. - USA), Alex van der Velden (Dassault Systemes Americas Corp. - USA) and Jeff Haan (Dassault Systemes Americas Corp. - USA)

10:30 – 17:30 - Parallel Session 2 (Salon David-Weill)

Session 2.1 - Human Centered Engineering

- 10:30-11:00 - Specifying some key SE training artifacts, David Gouyon, Fabien Bouffaron and Gérard Morel (Université de Lorraine/CRAN – France)
- 11:00-11:30 – Systems Engineering at Airbus, Philippe Lecornu (Airbus - France)
- 11:30-12:00 - Unifying Human Centered Design and Systems Engineering for Human Systems Integration, Guy André Boy (Florida Institute of Technology - USA) and Jennifer Narkevicius (Jenius LLC - USA)
- 12:00-12:30 - Integrated Product Team in Large Scale and Complex Systems, Sorin Aungurenci (Cassidian - Germany) and Aurel Chiriac (ISBC - Romania)

- **12:30-14:00: lunch at Salon Honnorat**

Session 2.2 - Green System Engineering

- 14:00-14:30 - A Virtual Web Net to eco-manage food packaging waste, Clara Ceppa and Gian Paolo Marino (Politecnico di Torino - Italy)
- 14:30-15:00 - An engineering systems model for the quantitative analysis of the energy-water nexus, William Naggaga Lubega and Amro. M. Farid (Masdar Institute of Science and Technology – United Arab Emirates)
- 15:00-15:30 - Water saving in a complex industrial system - Evaluation of the sustainability of options with System Dynamics, Katharina Tarnacki, Thomas Melin and Sabina Jeschke (RWTH Aachen University – Germany)
- 15:30-16:00 – Coffee Break

Session 2.3 - Architecture

- 16:00-16:30 – Policy Design: a New Area of Design Research and Practice, Jeffrey Johnson and Matthew Cook (The Open University - UK)
- 16:30-17:00 - Open Architecture for Naval CDS, Denis Janer and Chauk-Mean Proum (DCNS - France)
- 17:00-17:30 - Passenger's transport between platform and train within the metro in Paris, Jérôme Amory (RATP - France)

Tutorials – 3 tutorials from 10:30 to 17:30 in different salons of the conference site, only for persons who registered.

Tutorial 1 (Salon Branet)

- **Using the INCOSE SE Handbook to Engineer Complex Systems:** David Walden, CEO, Sysnovation - USA

Tutorial 2 (Salon Nathan)

- **How to Run an Efficient and Effective Requirements Review:** Paul Davies, Systems Design Engineer, Network Rail, UK. Formerly Head of Systems Engineering Research, Thales UK - Great-Britain

Tutorial 3 (Salon Preyer)

- **Design Structure Matrix (DSM) Methods and Applications:** Tyson Browning, professor, Neeley School of Business, TCU - USA

Systems Engineering Workshop (only for persons invited by Systematic Paris-Region)

10:00-13:30 – Presentation of the AGeSYS Project by Systematic Paris-Region

Location: Maison du Cambodge in the CIUP Campus

17:30-18:00 – End of the Conference

Best Papers Awards and Farewell Ceremony (Location: Amphitheater Adenauer)

Farewell Cocktail (Location: Salon “La Terrasse” at the ground floor just below Adenauer)

Happy Holiday Season 2013!