



## The 5<sup>th</sup> International Conference Complex Systems Design & Management (CSD&M 2014 )



**November 12 – 14, 2014 at Salons de l'Hotel des Arts et Métiers Métiers, Paris - France**

### **Wednesday, November 12, 2014 – Grand Challenge-Society and Grand Challenge-Industry/Poster Workshop**

The first day in the Salle La Rochefoucauld (underground) 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 at the conference site.

#### • **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 Frédéric Boulanger, Supélec - France
- 09:05-09:10 - Welcoming by the Program Committee co-chairs Gérard Morel, Université de Lorraine and Jean-Claude Roussel, Airbus Group Innovations - France
- 09:10-09:20 – Hervé Biaußer, director, Centrale Supélec - France
- 09:20-09:30 – Alexandre Corjon, alliance global VP engineering, Renault - France

#### • **09:30-12:30 – Grand Challenges - Society**

- 09:30-09:35 - Introduction by the session chairman
- 09:35-10:10 – Simplicity : Alain Berthoz, professor, Collège de France – France
- 10:10-10:50 – Coffee break
- 10:50-11:25 – Complex Cities : Representative, Grand Lyon – France
- 11:25-12:00 - Multimodal Transportation : Jeroen Kok, president, European Travelers Council – Netherlands
- 12:00-12:30 - Panel discussion
- 12:30-14:00 - Lunch at Salons President-Delage-Club (2<sup>nd</sup> floor - 1er étage)

#### ○ **14:00-17:00 – Grand Challenges - Industry**

- 14:00-14:05 - Introduction by the session chairman
- 14:05-14:40 – Information Systems: to be announced
- 14:40-15:15 – Energy: Thuy Nguyen, EDF – France
- 15:15-15:50 – Coffee break
- 15:50-16:20 – Aerospace : Simon Bradley, vice-president FRGS, Airbus Group – United Kingdom
- 16:20-17:00 - Panel discussion

- **17:00-19:00 - Poster Workshop & Conference Cocktail** (Salons on 2<sup>nd</sup> floor - 1er étage)

**Papers with authors confirming their participation to the conference:**

- Reuse / Variety Management & Systems Engineering, Olivier Renault (PLMSys Consulting - France)
- Complexity: Definition and Reduction Techniques, Some Simple Thoughts on Complex Systems, Jon Wade and Babak Heydari (Stevens Institute of Technology - USA)
- Correct by Prognosis : Methodology for a Contract-Based refinement of Evolution Models, Tayfun Gezgin and Christoph Etzien (OFFIS – Germany)
- Engineering a parent-system, designed to generate complex sub-systems in the field of defense planning, Wolfgang Peischel (Austrian Military Journal – Austria)
- System Engineering for a Cognitive Sciences Approach, Thomas Peugeot (Airbus Defense & Space – France)
- Formal Inter-Stellite Communications Requirements Development through Information Flow, Jules Chenou, William Edmonson and Albert Esterline (NC A&T State University – USA), Natasha Neogi (National Institute of Aerospace – USA)
- Taming the Complexity of Big-Data Multi-Cloud Applications with Models, Marcos Almeida, Andrey Sadovykh, Alessandra Bagnato and Etienne Brosse (Softteam – France)
- Probabilistic System Summaries for Behavior Architecting, Michael Borth (TNO – Netherlands)
- Accounting for Uncertainty and Complexity in the Realization of Engineering Systems, Warren F. Smith (University of New South Wales-Australian Defence Force Academy – Australia), Jelena Milisavljevic, Maryam Sabeghi, Janet K. Allen and Farrock Mistree (Systems Realization Laboratory – USA)
- Active Experimentation and Computational Reflection for Design and Testing of Cyber-Physical Systems, Kirstie Bellman (Topcy House Consulting – USA), Phyllis Nelson (California State Polytechnic University, Pomona – USA) and Christopher Landauer (The Aerospace Corporation – USA)
- Scalability in System Design and Management, the MONDO Approach in an Industrial Project, Alessandra Bagnato, Etienne Brosse and Andrey Sadovykh (Softteam – France)
- Extending a Suite of Modeling and Processing Tools and Tuning it to Meet Production Needs, Pascal Rivière and Olivier Rosec (CNAV – France)
- Urban Life Management : System Architecture Applied to the Conception and Monitoring of Smart Cities, Claude Rochet and Florence Pinot de Villechenon (ESCP EUROPE – France)
- SQUORE, an actionable dashboard based on SE leading indicators to manage System Engineering Effectiveness, Christophe Peron (Squoring Technologies – France)
- Design methodology for Changeable Manufacturing Systems, Nadège Benkamoun and Anne-Lise Huyet, (Institut Pascal – France), Khalid Kouiss, Carey Dilliot, Philippe Ducreuzot and Jean-Philippe Macron (Faurecia – France)
- TOPASE: Tools for Operability Assessment and Support Enhancement for life cycle system performance optimization, Christophe Ducamp and Charles Elegbede (Airbus Defence and Space – France)
- Requirements for Single Pilot Operations in Commercial Aviation: A First High-Level Cognitive Function Analysis, Guy André Boy (Florida Institute of Technology – USA)
- Toward Better Integration of Functional and Dysfunctional Models : Safety Architect, Frédérique Vallée, Anne-Catherine Vié, Jonathan Dumont (ALL4TEC – France), Nataliya Yakymets, Yupanqui Munoz Julho and Agnès Lanusse (CEA LIST – France)

## **Thursday, November 13, 2014 - Towards a theory of systems / Systems Architecture & Engineering Tools Session**

The second day of the conference in the Salle La Rochefoucauld 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 social event: conference visit & dinner will end the day.

- **09:00-12:20 - Scientific state of the art / Tools Session Part 1**
  - 09:00-09:05 – Introduction by the session chairman
  - 09:05-09:40 – Optimal Design: to be announced
  - 09:40-10:10 – Coffee break
  - 10:10-10:45 – Distributed System Design: Marc Shapiro, professor, Paris VI – France
  - 10:45-11:20 – Model driven embedded software design : Jean-Marc Jezequel, director, IRISA (INRIA Rennes) – France
  - 11:20-12:20 - Systems Architecture & Engineering Tools Session - Success stories
  - 12:20-12:30 – 5-min announcements
- **12:30-14:00 Lunch at Salons Président-Delage-Club** (2<sup>nd</sup> floor - 1<sup>er</sup> étage)
- **14:00-18:10- Methodological state of the art / Tools Session Part 2**
  - 14:00-14:05 - Presentation of the session chair
  - 14:05-14:40 – Big Data: Paul Eremenko, director, Google – USA
  - 14:40-15:15 – Transformation : Dominique Luzeaux, vice-director, Ministry of defense – France
  - 15:15-16:45 – Coffee break / Free visit to booths
  - 16:45-17:20 – Decision Aid: Donna Rhodes, senior scientist and SEArI and SSRC director, MIT – USA
  - 17:20-18:20 - Systems Architecture & Engineering Tools Session - Success stories
  - 18:20-18:30 - 5-min announcements
- **19:30-23:00 - Conference Visit & Dinner & The Atelier Renault : 53 Avenue des Champs-Elysées – 75008 Paris**
  - 19:30 - First visit
  - 19:50 - Second visit
  - 20:10 - Third visit
  - 20:30 - Dinner at the restaurant on 2nd floor (where carry-coats beside tables in free service)
  - 23:00 - End of the evening

## Friday, November 14, 2014 – Contributed Talks in 2 Parallel Sessions

The contributed talks will take place during the third and last conference day within thematic parallel sessions, where industrial and academic presentations are mixed. A farewell ceremony will end these parallel sessions as well as the conference. "Best papers awards" will be announced at this moment by Program Committee and Organizing Committee chairs and by the president of CESAMES. These 2 sessions are opened to all the CSD&M participants.

- **9:00-10:00 - Systems Modeling, Simulating and Decision Aid**, IRT SystemX - France (Location: Salle La Rochefoucauld)
  - 09:00-10:00 – Presentation and Questions & Responses
  - 10:00-10:30 - Coffee break and Taking place in Salons for Session or Tutorial
- **10:30-17:30 - Parallel sessions - "A la carte" Program: IBM Workshop, contributed talks, tutorials or workshop**

**IBM Workshop – MOBILEng / DANSE EU** (location: Salle La Rochefoucauld)

- 10:30-16:30; detailed program to be announced later

**Contributed Talks** - 2 parallel sessions opened to all the CSD&M participants

**10:30-17:30 - Parallel Session 1** (Location: Salon Club)

### **Session 1.1 - Systems Engineering in Large**

- 10:30-11:00 - Towards an extended interoperability systemic approach for dynamic manufacturing networks: role and assessment of PLM standards, Emna Moones, Thomas Vosgien and François Stephan (IRT SystemX - France), Nicolas Figay (Airbus Group – France), Lyes Kermad, Abderrahman El Mhamedi and El Mouloudi Dafaoui (Université Paris VIII - France)
- 11:00-11:30 - How to Boost Product Line Engineering with MBSE – A Case Study of a Rolling Stock Product Line, Hugo Guillermo Chalé Gongora, Marco Ferrogali and Christophe Moreau (Alstom Transport – France)
- 11:30 -12:00 - User-Centered Design for Emotion. A Case Study in Wellness Products, Sergio Gago (University of California at Irvine – USA) and Joaquim Lloveras (Technical University of Catalonia – Spain)
- 12:00-12:30 - Flexible Queries over Engineering Data, Yishai A. Feldman (IBM Research – Israel)
- **12:30-14:00: lunch** (buffet at 2<sup>nd</sup> floor 1<sup>er</sup> étage)

### **Session 1.2 – Executable Model Based Systems Engineering**

- 14:00-14:30 – A New Framework for the Simulation of Offshore Oil Facilities at the System Level, Marcel Bonnissel, Philippe Muguerra, Benjamin Poirson, Xavier Riou (Saipem SA – France), Joris Costes, Jean-Philippe Saut (Eurobios – France), Jean-Michel Ghidaglia, Nicolas Vayatis (CMLA, ENS, CACHAN – France ), Keld Lund Nielsen (Eni E&P – Italy)

- 14:30-15:00 – Timed Symbolic testing Framework for Executable Models Using High-Level Scenarios, Mathilde Arnault, Boutheina Bannour, Arnaud Cuccuru, Christophe Gaston, Sébastien Gérard, Arnault Lapitre (CEA – France)
- 15:00-15:30 – A Verification approach from MDE Applied to Model Based System Engineering: xeFFBD Dynamic Semantic, Christophe Dony (LIRMM – France), Blazo Nastov, Vincent Chapurlat, François Pfister (LGI2P Ecole des mines d'Alès – France)
- 15:30-16:00 – **Coffee Break**

### Session 1.3 – Systems Thinking and Fundamentals

- 16:00-16:30 – The Hidden Perils of Addressing Complexity with Formal Process : A Philosophical and Empirical Analysis, Paul Nugent, Emilio Collar (Western Connecticut State University – USA)
- 16:30-17:00 – A Formal Foundation of Systems Engineering, Dominique Luzeaux (DIRISI - France)
- 17:00-17:30 – Ontology-Assisted Systems Engineering Process with Focus in the Requirements Engineering Process, Anabel Fraga, Juan Llorens (University of Carlos III at Madrid – Spain), José Fuentes (The REUSE Company – Spain)

**10:30-17:30 - Parallel Session 2** (Location : Salon Président-Delage)

### Session 2.1 – Systems Architecting in Large

- 10:30-10:54 – FILA-SoS : Simulation and Modeling Techniques for Acknowledge SoS, Cihan Dagli, Renzhong Wang, Siddharta Agarwal (Missouri University of Science and Technology – USA)
- 10:54-11:18 – Leveraging Domain Expertise in Architectural Exploration, Henry Broodney, Michael Masin, Uri Shani, Evgeny Shindin (IBM – Israel), Roy Kalawsky, Demetrios Joannou, Yingchun Tian, Antara Bhatt (Loughborough University – United Kingdom), Imad Sanduka (Airbus Innovation Works – Germany)
- 11:18-11:42 – Preliminary Hazard Analysis Generation Integrated with Operational Architecture – Application to Automobile, Pierre Mauborgne, Dominique Loise (PSA-Peugeot Citroën – France), Samuel Deniaud (UTBM – France), Jean-Pierre Micaëlli (Centre des Humanités – France), Eric Levrat (University of Lorraine – France), Eric Bonjour (ERPI – France)
- 11:42-12:06 – Dependency Analysis as a Heat Map for Architecture Standardization, Johannes Becker, Mark Gilbert, Armin Frög, Markus Lienkamp (Technische Universität München – Germany), Matthias Kreimeyer (MAN Truck & Bus AG – Germany), Donna H. Rhodes (MIT – USA)
- 12:06–12:30 – MoSaRT Framework : a Collaborative Tool for Modeling and Analyzing Embedded Real-Time Systems, Yassine Ouhammou, Emmanuel Grolleau, Michaël Richard (LIAS/ ISAE-ENSMA – France), Pascal Richard (LIAS/ University of Poitiers – France), Frédéric Madiot (Obeo – France)
- **12:30-14:00: lunch** (buffet at 2<sup>nd</sup> floor - 1<sup>er</sup> étage)

## Session 2.2 – Transportation Systems Architecting

- 14:00-14:30 – A Multi-Criteria Methodology for Prioritizing Security Investments, Michelle Dojutrek, Samuel Labi, J.Eric Dietz (Purdue University – USA)
- 14:30-15:00 – User-Based Solutions for Increasing Level of Service in Bike-Sharing Transportation Systems, Juste Rimbault (Ecole Polytechnique – France)
- 15:00-15:30 – A Brief Description of Carsharing Integration within a Multimodal Transport System, Aurelien Carlier, Fabien Tschirhart, Frédéric Da Silva, François Stephan (Technological Research Institute SystemX – France), Manel Abid, Lionel Scremin (Alstom Transport – France), Alix Munier-Kordon (University of Pierre and Marie-Curie – France), Olivier Thoni (Artelys – France)
- 15:30-16:00 – Coffee Break

## Session 2.3 – Socio-Technical Systems Architecting

- 16:00-16:30 – Seven Issues on Distributed Situation Awareness Measurement in Complex Socio-Technical Systems, Maria Mikela Chatzimichailidou, Angelos Protopapas, Ioannis Dokas (Democritus University of Thrace – Greece)
- 16:30-17:00 – Collision by Catching Up Between Two Trains in the Metro in Paris, Jérôme Amory (RATP – France)
- 17:00-17:30 – How Can Usage Monitoring Improve Resilience? , Jean-René Ruault, Frédéric Vanderhaegen, Christophe Kolski (UVHC, LAMIH – France)

**Tutorials** – 2 tutorials from 10:30 to 17:30 in different salons of the conference site, only for persons who registered.

**Tutorial 1** (Location: Salon Berthollet)

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

**Tutorial 2** (Location: Salon Laplace)

- **Building a Foundation for Continual System Engineering and Self-improvement in Complex Systems: Kirstie Bellman, Chris Landauer and Phyllis Nelson**, PhD Topcy House Consulting and California State Polytechnic University – USA

### ○ 17:30-18:00 – End of the Conference

- 17:30-17:50 - Best Papers Awards and Farewell Ceremony

Location: Salle La Rochefoucauld

- 17:50-18:30 – Farewell Cocktail

Location: Hall Rochefoucauld

*Happy Holiday Season 2014!*