



CSD&M Asia 2016 Conference Program

Wednesday 24 February 2016 – Societal and Industrial Challenges / Poster Workshop

The first day of the conference is dedicated to the presentation of the societal & governmental & industrial contexts of complex systems engineering. It consists of a number of high-profile seminars who will give a clear and synthetic vision of the domain around the main keynote speakers' theme of this 2nd edition: "**Smart Nations – Sustaining and Designing**". The Poster Workshop will blend into breaks/cocktail of the whole day.
(Location – Auditorium)

09:00-09:20 – Opening of the Conference

- 09:00-09:05 - Welcoming by the Chair of the Organizing Committee: Mr. Yang How TAN, President of the DSTA Academy
- 09:05-09:10 - Welcoming by Prof. Tow Chong CHONG, Provost of the Singapore University of Technology and Design (SUTD)
- 09:10-09:15 - Welcoming by the two general conference co-chairmen: Prof. Pao Chuen LUI, Adviser, National Research Foundation, Prime Minister's Office and Prof. Daniel KROB, President of CESAMES and Institute Professor, Ecole Polytechnique
- 09:15-09:20 - Welcoming by the 3 Co-Chairs of the Program Committee: Prof. Michel-Alexandre CARDIN, NUS / Mr. Saik Hay FONG, ST Engineering / Mr. Yang How TAN, DSTA Academy

09:20-12:40 – Societal Challenges – Panel 1 on "Technology & Policy"

- 09:20-09:25 - Introduction of the Session Chair: Peter HO, Senior Adviser, Centre for Strategic Futures - SG
 - 09:25-09:50 - **Systems Engineering: A Critical Discipline in Whole-of-Govt Approach to Urban Water Development** by Mr. Gee Paw TAN, Chairman, PUB, The National Water Agency – SG
 - 09:50-10:15 - **Future of Engineering Education in the World Based on Design and Systems** by Prof. Thomas MAGNANTI, President, Singapore University of Technology and Design - SG
 - 10:15-10:40 - **Liveable and Sustainable Cities – the Urban Systems Approach** by Mr. Teng Chye KHOO, Executive Director, Centre for Liveable Cities, Ministry of National Development – SG
- 10:40-11:10 - Coffee break & *Free visit to posters*
- 11:10-11:35 - **Singapore: What does Smart Mean?** by Mr. Kok Yam TAN, Head, Smart Nation Programme Office (SNPO) – SG

- 11:35-12:00 - **The Need for Technology Policy Programs: Example of Big Data** by Prof. Richard DE NEUFVILLE, Professor, MIT - US
- 12:00-12:40 - **Panel 1 “Technology & Policy”**, led by Mr. Peter HO, Senior Adviser, Centre for the Strategic Futures – SG, with Q&R of keynote presentations and panelists Thomas MAGNANTI, Teng Chye KHOO, Kok Yam TAN and Richard DE NEUFVILLE

12:40-13:40 - Lunch Break & *Free visit to posters*

13:40-16:10 – Industrial Challenges – Panel 2 on “Challenges of Understanding and Creating Operational Concepts for a Smart City”

- 13:40-13:45 - Introduction of the Session Chair: Ms. Kerry LUNNEY, Engineer Thales & Headed of INCOSE Asia-Oceania Sector
- 13:45-14:10 - **Systems Engineering in an Inter-Connected World** by Mr; Peng Yam TAN, Chief Executive, Defence Science & Technology Agency (DSTA) – SG
- 14:10-14:35 - **Civil, Dual and Military Engineering in Complex Systems** by Mr. Erick LANSARD, Vice President Technical & Space Development, Thales – FR

14:35-15:05 - *Coffee break & Free visit to posters*

- 15:05-15:30 - **Integrated Infrastructure Value-Chain Planning for Industrial Estates and Buildings** by Mr. Soon Poh HEAH, Assistant CEO for Engineering & Operations, JTC – SG
- 15:30-16:10 - **Panel 2 “Challenges of Understanding and Creating Operational Concepts for a Smart City”** (with all Q&R of afternoon keynote speakers, led by Kerry LUNNEY with panelists Serge LANDRY, Bill PARKINS and Nikhil JOSHI – INCOSE Asia-Oceania)

16:10-18:00 - Poster Workshop & Conference Cocktail

(Location – Campus Centre)

- *Modelling Resilience in Interdependent Infrastructures: Real-world Considerations* - Mong Soon SIM and Kah Wah LAI (DSO National Laboratories - SG)
- *System Engineering Workbench for Multi-Views Systems Methodology with 3DEXPERIENCE Platform- The Aircraft RADAR Use Case* - Emilio GOMEZ, Christophe FERNANDES, Hatim ADLI and Eliane FOURGEAU (Dassault Systemes – FR)
- *The Methodology to Integrate the Information Concerned About the Safety Between Many Kinds of Materials About the Space System* - Nasa YOSHIOKA, Nobuyuki KOBAYASHI and Seiko SHIRASAKA (Keio University – JP)
- *Information Architecture for Complex Systems Design and Management* - Wael HAFEZ (WHA Research Inc. - US)
- *A CLEAN Way for Sustainable Solid Waste Management System for Singapore* - Zhongwang CHUA, Jun Wen FONG, Guoquan LAI, Sheng Yong Kenny TEO, Kevin George WILLIAMS, Chee Mun Kelvin WONG and Eng Seng CHIA (NUS/TDSI - SG)
- *Mexico Ciudad Segura* - Jean LANCELIN and Haoming HUANG (Thales – FR/SG)
- *Product Line Management – Convergence Architecture, Market and Operational Gains* - Antoine TRUONG, Helene BACHATENE, Serge LANDRY and Keng Hoe TOH (Thales – FR/SG)

Thursday 25 February 2016 – Towards a Theory of Systems / Panel / Systems Architecture & Engineering Tools Session

The second day of the conference is devoted to systemic methodologies and fundamentals emerging from academic as well as industrial or governmental environments. It is centered on the fact that the architectural paradigm can help to think about complex systems in a unified way. The main keynote speakers' theme of this 2nd edition is: "**Smart Nations – Designing and Sustaining**". The conference dinner will end the day.
(Location – Auditorium)

09:00-12:30 - Scientific State of the Art / Panel / Systems Architecture & Engineering Tools Session I

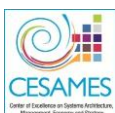
- 09:00-09:05 - Presentation of the session by the session chair – Prof. Daniel KROB, Institute Professor, Ecole Polytechnique - FR
- 09:05-09:35 (with Q&R) - **Systems Architecture for Complex Ecosystems** by Prof. Daniel KROB, Ecole Polytechnique - FR
- 09:35-10:05 (with Q&R) - **Building Confidence in Complex Systems Models for Reducing Population Health Risks** by Dr. Theresa BROWN, Distinguished Member of Technical Staff & Program Manager, Sandia National Laboratories – US
- 10:05-10:35 (with Q&R) - **The journey towards Model Based Engineering** By Mr. Alan D. HARDING, INCOSE President – UK
- 10:35-11:05 - *Coffee break*
- 11:05-11:35 (with Q&R) - **Addressing the New Challenges of the Rapidly Urbanizing World with Big Data** by Dr. See Kiong NG, Program Director, Urban Systems Initiatives, Agency of Science, Technology and Research (A*STAR) – SG
- 11:35-12:00 – **Panel 3 “Models & Methods for Complex Systems Design”**, led by Prof. Daniel KROB, Ecole Polytechnique – FR, with panelists Dr. Theresa BROWN and Mr. Alan D. HARDING
- 12:00-12:30 - **Systems Architecture & Engineering Tools Session I – Free visit to booths**

12:30-13:30 - *Lunch Break*

13:30-17:30 - Methodological State of the Art / Systems Architecture & Engineering Tools Session II

- 13:30-14:30 - **Systems Architecture & Engineering Tools Session II** - Success stories of Dassault Systemes (by Michel HAGEGE, director of worldwide business dvpt), EDF (by Pablo VIEJO, general administrator & head of EDF SG), Surbana Jurong (by Tat Leong CHEW, senior consultant) and Accenture Beijing (by Dong LIU, deputy director)
- 14:30-14:35 - Presentation of the session chair
- 14:35-15:05 (with Q&R) - **Mathematical Modelling of Complex Systems** by Prof. Kate SMITH-MILES, Monash University - AS
- 15:05-15:35 (with Q&R) – **Systems Design Innovation for a Smart Nation** by Prof. Kristin WOOD, Singapore University of Technology & Design – SG
- 15:35-16:05 (with Q&R) - **Leadership as a Robust Response to Complexity** by Mr. Jimmy KHOO, Managing Director, Singapore District Cooling at Singapore Power Ltd - SG
- 16:05-16:35 - *Coffee break*
- 16:35-17:00 - **Systems Architecture & Engineering Tools Session I – Free visit to booths**
- 17:00-17:30 - Launch of the Call for Papers CSDM Asia 2017/ Announcements / End of the second day by Prof. Pao Chuen LUI and Daniel KROB

19:00-22:00 – Conference Dinner at the Ballroom 2 of the Fullerton - Event sponsored by Sembcorp / For registered participants only



Friday 26 February 2016 – Open Sessions followed by Contributed Talks and Tutorial

The third and last conference day is dedicated to two plenaries presentations followed by two contributed sessions (opened to all participants), and by the tutorial “Big Data & Data Analytics” (extra activity to register apart). A farewell ceremony will end the conference and best papers awards will be announced at this moment by Pao Chuen LUI and Daniel KROB, general co-chairs of the CSD&M Asia 2016.

9:00-10:00 – Open Session 1 – Surbana Jurong & Guests head by Mr. Keen Joe POON (GCTO and Managing Director of Smart City Solutions, Surbana Jurong – SG (Location – Auditorium)

10:00-10:30 – Open Session 2 – Council of Engineering Systems Universities (CESUN) head by Prof. Larry HEAD, University of Arizona and Olivier DE WECK, MIT – US (Location – Auditorium)

10:30-11:00 - Coffee break

11:00-17:00 - "A la carte" Program: Contributed Talks/ 13:30-17:00 Tutorial “Big Data & Data Analytics”

Contributed Talks – Session 1 – Presented by authors of selected papers opened to all participants (Location: Lecture Theatre 4)

Session 1-1 – Data Analytics

- 11:00-11:30 – *Inferring activities and optimal trips: lessons from Singapore’s National Science Experiment* - Barnabe MONNOT, Georgios PILIOURAS, Erik WILHELM, Yuren ZHOU (SUTD – SG), Daniel DAHLMEIER, Hai Yun LU and Jin WANG (SAP – SG)
- 11:30-12:00 – *Portfolio Decision Technology for Designing Optimal Syndemic Management Strategies* - Matteo CONVERTINO and Yang LIU (University of Minnesota - US)
- 12:00 -12:30 - *Using social sciences to enhance the realism of simulation for complex urban environments* - Stephen Keh Chew CHAI, Mohd. Faisal Bin Zainal ABIDEN, Hui Min NG, Shawn THIAN, Sidney TIO, Serge LANDRY and Antoine FAGETTE (Thales – SG/FR)

12:30-13:30 – Lunch Break

Session 1-2 – Systems Architecture

- 13:30-14:00 - *Framework for Managing System-of-System Ilities* - Zhengyi LIAN, Siow Hiang TEO (DSTA-SG)
- 14:00-14:30 - *A general framework for critical infrastructure interdependencies modeling using economic input-output model and network analysis* - Jiwei LIN, Kang TAI, Robert Tiong Lee KONG (NTU – SG) and Mong Soon SIM (DSO National Laboratories - SG)
- 14:30-15:00 - *Expansionism-Based Design and System of Systems* – Jianxi LUO (SUTD – SG)

15:00-15:30 - Coffee break

Session 1-3 - Sustainability and Resilience

- 15:30-16:00 - *Introducing Cyber Security at the Design Stage of Public Infrastructures: A Procedure and Case Study* - Sridhar ADEPU and Aditya MATHUR (Singapore University of Technology and Design – SG)
- 16:00-16:30 - *Renewable integration in island systems – a system dynamics assessment* - George MATTHEW, William J NUTTALL, Ben MESTEL and Laurence DOOLEY (The Open University – UK)
- 16:30-17:00 - *Ontology for Weather Observation System* - Yuki ONOZUKA, Makoto IOKI and Seiko SHIRASAKA (Keio University – JP)



Contributed Talks – Session 2 – Presented by authors of selected papers opened to all participants
(Location: Lecture Theatre 5)

Session 2-1 – Design and Optimization

- 11:00-11:30 - *Design for Affordability from System to Programme to Portfolio using Tradespace-based Affordability Analysis: An Application to a Federated Satellite System Design Case Study1* - Marcus Shihong WU (Defence Science & Technology Agency - SG)
- 11:30-12:00 - *Holistic Integrated Decisions Trade-Off Analysis-Baseline for an Optimal Virtual IP Multimedia Subsystem (IMS)* - Arevik GEVORGYAN, Daniel KROB (Laboratoire d'Informatique LIX École Polytechnique - FR) and Peter SPENCER (Alcatel-Lucent – FR)
- 12:00 -12:30 - *An optimization framework for terminal sequencing and scheduling: The single runway case* - Jitmitra DESAI and Rakesh PRAKASH (Nanyang Technology University – SG)

12:30-13:30 – Lunch Break

Session 2-2 – Systems Engineering

- 13:30-14:00 - *A Model-Based Testing Process for Enhancing Structural Coverage in Functional Testing* - Yanjun SUN, Gerard MEMMI and Sylvie VIGNES (Télécom ParisTech - FR)
- 14:00-14:30 - *Managing the Embedded Systems Development Process with Product LifeCycle Management* - Emilio GOMEZ, Eliane FOURGEAU and Michel HAGEGE (Dassault Systemes – FR)
- 14:30-15:00 - *Establishment of Model-Based Systems Engineering Approach for Rapid Transit System Operation Analysis* – Sin Hin OH, Mohamad Azman OTHMAN and Chuan Heng TAN (Land Transport Authority - SG)

15:00-15:30 - Coffee break

Session 2-3 – Future Systems

- 15:30-16:00 - *Foresight Study on Singapore Urban Mobility: Methodologies and Preliminary Insights* - Seyed Mehdi ZAHRAEI, Christopher CHOO, Waqas CHEEMA and Lynette CHEAH (SUTD - SG)
- 16:00-16:30 - *A Systematic Approach to Safe Coordination of Dynamic Participants in Real-time Distributed Systems* - Mong Leng SIN (DSO National Laboratories – SG)

13:30-17:00 - Tutorial (Location: Think Tank 16, for registered persons only):

Big Data & Data Analytics, led by Dr. See-Kiong NG, ASTAR - SG

- 13:30-14:00 - *Stories that Data Tells : Use Cases of Big Data and Analytics* by Shonali KRISHNASWAMY (Data Analytics Department, Institute for Infocomm Research, A*STAR - SG)
- 14:00-14:30 - *Learning from Big Data: New Machine Learning Paradigms* by Shaowei LIN (Sense & Sense-abilities Department, Institute for Infocomm Research, A*STAR and SUTD - SG)
- 14:30-15:00 - *Computing on Big Data: Architectures and Algorithms* by Artur ANDRZEJAK (Heidelberg University - DE)

15:00-15:30: Coffee break

- 15:30-16:15 - *Developing a Big Data and Analytics Platform for Smart Cities – A*DAX* by Wee Siong NG (Urban Systems Initiative, Institute for Infocomm Research, A*STAR - SG)
- 16:15-17:00 - *Robustness in Decision-Making in Uncertainty*, contributed by Professor Karthik NATARAJAN (SUTD - SG)

17:00-18:30 - Farewell Cocktail announced by Prof. Pao Chuen LUI and Prof. Daniel KROB, CSD&M Asia 2016 General Co-Chairs and all committees members present (location Auditorium)

