



conference on systems engineering research

Recent Trends and Advances in Model-Based Systems Engineering

18th Annual Conference on Systems Engineering Research (CSER)
Crowne Plaza Hotel, Redondo Beach, CA

Technical Program: Day 1

7:00 - 8:00	Breakfast	<i>Redondo Foyer</i>
	Registration	<i>Coral Foyer</i>
9:00 - 16:00	SEANET Doctoral Workshop	<i>USC</i>
8:00 - 17:00	NSF Workshop on Systems Engineering Challenges & Opportunities	<i>Peninsula/Pacific</i>
	Foundations for Systems Engineering (F4SE) Workshop	<i>Marina</i>
	Tutorial: Enterprise Modeling using UAF	<i>Esplanade</i>
8:00 -10:00	Tutorial: MBSE Overview – Part 1	<i>Bay</i>
	Tutorial: Parallel Agile - Part 1	<i>Catalina</i>
	INCOSE ASEP Tutorial	<i>Ocean</i>
10:00-10:30	Break	<i>Redondo Foyer</i>
10:30-12:00	Tutorial: MBSE Overview – Part 2	<i>Bay</i>
	Tutorial: Parallel Agile – Part 2	<i>Catalina</i>
	INCOSE ASEP Tutorial	<i>Ocean</i>
12:00-13:00	Lunch	<i>SOL</i>
13:00-15:00	Tutorial: Preparing MBSE for Industry 4.0 & IOT– Part 1	<i>Bay</i>
	Tutorial: Data Analytics- Part 1	<i>Catalina</i>
13.30-15.30	ASEP Certification Exam	<i>TBD</i>
15:00-15:30	Break	<i>Redondo Foyer</i>
15:30-17:00	Tutorial: Preparing MBSE for Industry 4.0 & IOT- Part 2	<i>Bay</i>
	Tutorial: Data Analytics– Part 2	<i>Catalina</i>
17:00-18:00	Invited Lecture by Dr. Bernie Ziegler	<i>Bay</i>
18:00-20:00	SEANET Poster Session and Welcoming Reception	<i>SOL</i>

Technical Program: Day 2

7:00-8:00	Breakfast					Redondo & Redondo Foyer
7:00-17:30	Registration					Coral Foyer
	Exhibits					Redondo
8:00-10:00	Opening Remarks and Welcome: Dr. Azad M. Madni , Conference General Co-chair					Peninsula/Pacific
	<p style="text-align: center;">Keynote Presentations</p> <ul style="list-style-type: none"> General (Ret.) Ellen M. Pawlikowski, Judge Widney Professor at USC Mr. Scott Miller, Executive Chief Engineer, Automated Driving, & Executive Director, AV/EV Integration, GM 					
10:00-10:30	Break					Redondo & Redondo Foyer
Morning Breakout Sessions						
	Peninsula/Pacific	Enterprise Architecture Applications <i>Bay</i>	Ontology-enabled SE <i>Catalina</i>	MBSE Lifecycle <i>Esplanade</i>	Modeling and Simulation in Systems Architecting <i>Marina</i>	Advances in Systems Science <i>Ocean</i>
10:30-11:00	Panel-Smart Manufacturing: Recent Trends and Success Stories	Enterprise Architecting Applied to Small Unmanned Aircraft System Integration into Low Altitude Urban Airspace Raymond Vetter and Donna Rhodes	An Ontology for System Reconfiguration: Integrated Modular Avionics IMA Case Study Lara Qasim, Andreas Makoto Hein, Sorin Olaru, Marija Jankovic and Jean-Luc Garnier	Implementing a MOSA Decision Support Tool in a Model-Based Environment Michael Dai, Cesare Guariniello and Daniel DeLaurentis	Towards modeling and simulation driven systems architecting: a "threaded" approach Sachin Mehta	A Systems Science Basis for Compositionality Reasoning Swaminathan Natarajan, Anand Kumar and Subhrojyoti Roy Chaudhuri
11:00-11:30		Application and modelling of systems engineering methods to deployed enterprise content management systems Stephan Bren	Reducing Design Rework using Set-based Design in a Model Centric Environment Shawn Dullen, Dinesh Verma and Mark Blackburn	Change Management Processes in MBSE Isabeta Rountree, Victor Lopez and L. Dale Thomas	A survey of super-resolution techniques for a potential CubeSat imagery system architecture William Symolon and Cihan Dagli	Towards the Design of Artificial Swarms Using Network Motifs Khoinguyen Trinh and Zhenghui Sha
11:30-12:00		Identification of Elements and Element Relationships for Organizational Architectures for Systems Engineers Garima Bhatia and Bryan Mesmer	Knowledge Representation and Reasoning in the Context of Systems Engineering Hanumanthrao Kannan	A Literature Review of the Integration of Test Activities into the Development Process Aksel Elkjaer and Geir Ringen	Automated Detection of Architecture Patterns in MBSE Models Matthew Cotter, Michael Hadjimichael, Aleksandra Markina-Khusid and Brian York	Influence of representation on complexity measurement: insights from interdisciplinary robotic design problems Anthony Hennig and Zoe Szajfarber
12:00-13:30	Lunch					Seascape Ballroom
Afternoon Breakout Sessions and Panels						

Technical Program: Day 2

13.30-15.00	Panel - Research Agenda for Mission Engineering				<i>Peninsula/ Pacific</i>
15:00-15:30	Break				<i>Redondo & Redondo Foyer</i>
Afternoon Breakout Sessions and Panels					
	Probabilistic Modeling and Analytics <i>Bay</i>	Digital Engineering and MBSE <i>Catalina</i>	Ontology-enabled SE <i>Esplanade</i>	MBSE for Automotive Systems <i>Marina</i>	Systems Modeling Applications <i>Ocean</i>
15:30-16:00	Data analytics of a honeypot system based on a Markov decision process model Lidong Wang, Randy Jones and Terril Falls	Towards a Reference Architecture for Digital and Model-based Engineering Information Systems Hayden Daly and Paul Grogan	Ontology-driven Knowledge Modeling and Reasoning for Multidomain System Architecting and Configuration Leonard Petnga	Optimal Management & Configuration Methods for Automobile Cruise Control Systems Arun Adiththan, Kaliappa Ravindran and S Ramesh	Quantitative System Reliability and Availability Analysis Using SysML Jaron Chen, Michael Hailwood and Myron Hecht
16:00-16:30	Probabilistic System Modeling for Complex Systems Operating in Uncertain Environments Parisa Pouya and Azad Madni	Digital Engineering Ecosystem for Future Nuclear Power Plants: Innovation of Ontologies, Tools, and Data Exchange Christopher Ritter, Jeren Browning, Lee Nelson, Tammie Borders, John Bumgardner and Mitchell Kerman	Ontological Modeling of Time and Time-Based Reasoning for Systems of Systems Surya Vamsi Varma Sagi and Leonard Petnga	Model-driven safety of autonomous vehicles Nicholas Annable, Alison Bayzat, Zinovy Diskin, Mark Lawford, Richard Paige and Alan Wassying	A framework for using the MAKE methodology and tool for objective manufacturability decision analysis Sara Fuller, Tonya McCall, Terril Falls, Christina Rinaudo and Randy Buchanan
16:30-17:00	Dynamic Causal Hidden Markov Model Risk Assessment Michael Sievers and Azad Madni	Introducing digital doppelgangers for health care policy analysis Jennifer Legaspi and Shamsnaz Virani Bhada	Minimum Viable Model to Demonstrate Value Proposition of Ontologies for MBSE and Digital Engineering Azad Madni	Model-aided Inference of Control Structures in Networked Systems: A Security Perspective Kaliappa Ravindran, Arun Adiththan, Michael Iannelli and Mohammad Rabby	Assurance case property checking with MMINT-A and OCL Nick Fung, Sahar Kokaly, Alessio Di Sandro and Marsha Checkik
17:00-17:30	Identification of Adverse Operational Conditions in Sociotechnical Systems: A Data Analytics Approach Taylan Topcu, Konstantinos Triantis and Bart Roets	Closed-Loop Model-Based Systems Engineering with Digital Twins Shatad Purohit and Azad Madni	Ontology-Enabled Hardware-Software Testbed for Engineering Adaptive Systems Edwin Ordoukhanian and Azad M. Madni	A Model-Based Engineering Approach for Development of ADAS Features Joseph D'Ambrosio, Arun Adiththan, Prakash Peranandam, Ramesh S. and Grant Soremekun	Interpretation Discrepancies of SysML State Machine: An Initial Investigation Ben Cratsley, Siwani Regmi, Paul Wach and Alejandro Salado
17:30-18:00	Presentation-The INCOSE FuSE project on Foundations for SE (F4SE)				<i>Bay</i>
18:30-19:00	Pre-Banquet Social				<i>Coral Foyer</i>
19:00-21:00	Banquet Dinner				<i>Peninsula/Pacific</i>

7:00-8:00	Breakfast					<i>Redondo & Redondo Foyer</i>
7:00-17:00	Registration					<i>Coral Foyer</i>
	Exhibits					<i>Redondo</i>
8:00-10:00	Opening Remarks: Dr. Barry Boehm , Conference General Co-chair					<i>Peninsula/Pacific</i>
	<p style="text-align: center;">Keynote Presentations</p> <ul style="list-style-type: none"> • Lt. Gen. (Ret.) Larry James, Deputy Director, Jet Propulsion Lab • Mr. Jon Damush, Senior Director, New Business Ventures Boeing NeXt 					
10:00 – 10.30	Break					<i>Redondo & Redondo Foyer</i>
Morning Breakout Sessions						
	<i>Peninsula/ Pacific</i>	MBSE Languages <i>Bay</i>	MBSE Economics <i>Catalina</i>	Defense Applications of MBSE <i>Espalande</i>	MBSE Applications <i>Marina</i>	Advances in MBSE <i>Ocean</i>
10:30 – 11:00	Panel – Exploring Digitization of Human Bias	The Need for Semantic Extension of SysML to Model the Problem Space Paul Wach and Alejandro Salado	COSYSMO 3.0’s Improvements in Estimating and Methodology James P Alstad	Optimizing Model Based Systems Engineering for Multi Domain Battle Dennis Chapman	A Bio-inspired Framework for Analyzing and Predicting the Trade-off between System of Systems Attributes Abheek Chatterjee, Richard Malak and Astrid Layton	Project managers and systems engineers - “Can two walk together, except they be agreed?” Recent research findings on development projects Sigal Kordova, Eyal Kats and Moti Frank
11:00 - 11:30		Variant modeling for multi-perspective, multi-fidelity systems simulation Ryan Colletti, Ahsan Qamar, Sandro Nuesch, William Bailey and Christiaan Paredis	Integrating the Constructive Systems Engineering Cost Model with the System Modeling Language James Dalton	A Systems Modeling Illustration of the Military Academy Doolie Cadet System Martin Span and Nathan Oh	Model-Based Systems-of Systems Healthcare: Coordinating the Coordinators Bernard Zeigler	Experimental Template for MBSE Case Study Research Marilee Wheaton
11:30 – 12:00		An Executable Systems Modeling Language (ESysML): Motivations and Overview of Language Structure Matthew Amisshah and Holly Handley	Towards Making the Business Case for MBSE Shatad Purohit and Azad Madni	A plan for model curation at the US Army Armaments Center Christina Jauregui and Mary Bone	Comparing weighting strategies for SME-based manufacturability assessment scoring Emily Wall, Christina Rinaudo and Richard Salter	Functional Decomposition: Evaluating Systems Engineering Techniques Cal M. Cluff and Dinesh Verma
12:00-13:30	Lunch					<i>Seascope Ballroom</i>

Afternoon Breakout Sessions and Panels

	MBSE in Aerospace <i>Bay</i>	Model-Based Decision Support <i>Catalina</i>	Beyond MBSE <i>Esplanade</i>	MBSE and Digital Engineering <i>Marina</i>	<i>Ocean</i>
13:30 - 14:00	Model-Based Systems Engineering for CubeSat FMECA Evelyn Honoré-Livermore and Cecilia Haskins	Collaborative Management of Research Projects in SysML Benjamin Kruse, Thomas Hagedorn, Mary Bone and Mark Blackburn	An Approach to Improve Hurricane Disaster Logistics Using System Dynamics and Information Systems Jeanne-Marie Lawrance, Niamat Ullah Ibne Hossain, Chirstina Rinaudo, Randy Buchanan and Raed Jaradat	A Review of Set-Based Design Research Opportunities Nicholas Shallcross, Gregory Parnell, Edward Pohl and Eric Specking	Round Table - Expanding the Perception of Digital Twin to Encompass Codification of Socio-technical knowledge Networks
14:00-14:30	Model-Based Systems Engineering for Design of Unmanned Aircraft Traffic Management Systems Martin Lindsey, Samantha Rawlins and Leonard Petnga	Supporting the Application of Dynamic Risk Analysis to Real-World Situations using Systems Engineering: A focus on the Norwegian Power Grid Management Michael Pacevicius, Cecilia Haskins and Nicola Paltrinieri	Transdisciplinary Systems Engineering Approaches Michael Watson, Bryan Mesmer, Dorothy Mckinney and Azad Madni	Investigating Model Credibility within a Model Curation Context Donna Rhodes	
14:30-15:00	Exploration of MBSE Methods for Inheritance and Design Reuse in Space Missions Alejandro Trujillo and Azad Madni	Toward A Reliability Approach Decision Support Tool For Early System Design: Physics Of Failure Vs. Historical Failure Data John Kosempel, Bryan O'Halloran and Douglas L. Van Bossuyt	Use of Models in Systems Engineering: From Engineering Artifacts to Source of Competitive Advantage Azad M. Madni	Digital Modernization and You Jorge Buenfil, Arnold Ross and Benjamin Abruzzo	
15:00-15:30	Break				<i>Redondo & Redondo Foyer</i>
15:30-17.30	Executive Leadership Panel				<i>Peninsula/ Pacific</i>