



Overview of SysML v2 Content at IS26

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Summary of SysML v2 Content at IS26

- Tutorials: 1
- Panels: 1
- Papers: 9
- Paperless Presentations: 11
- Reserve Paper / Posters: 4

Summary of SysML v2 Content at IS26

Title	Type
Writing Queries in SysML v2	Tutorial
Gen AI enabled Dependent Failure Analysis using SysML V2 pipeline for mixed safety criticality SDV Platform architecture	Paperless presentation
Enabling Seamless OEM-Supplier Collaboration through the SysMLv2 API: An MBSE approach for inter-organisational information exchange	Paperless presentation
A Multi Agent Approach to Validating Systems Models	Paper
A usage first modelling methodology in SysML v2	Paper
Lifecycle Interoperability for eVTOL System Design Using a SysML v1 to v2 Digital Thread	Paperless presentation
Model-Driven Engineering for Modeling and Simulating Satellite Power Systems: A Case Study	Paperless presentation
AI-Supported Engineering Automation Through Integrated Systems Modeling With SysML v2: A Use Case Showing Challenges and Opportunities in Modern Mechatronic System Development	Paper
SysML v2 as the Glue: Scalable MBPLE with a System-Driven Feature Approach	Paper
Executable Multidisciplinary Workflows Lowering Barriers to MBSE: Validating a Middle-Out MDAO-led Adoption Strategy through STOP Analysis	Paperless presentation

Summary of SysML v2 Content at IS26

Title	Type
From Architecture to Analysis: Is the SysML v2 API the Missing Link Between MBSE and Simulation?	Panel
Closing the V-Cycle: A SysML v2 - Aligned MBSE Co-Simulation Workflow for Autonomous eVTOL V&V	Paperless presentation
MBSE and simulation-based development for automotive mixed criticality systems	Paperless presentation
SysML v2 as Serialization Format for Avionics Development	Paper
A SysML v2 Modeling Pattern for Recursive System Decomposition	Paper
Top 10 Failure Modes in MBSE & Digital Engineering Programs - and How SysML v2 Helps (and Sometimes Hurts)	Paperless presentation
Towards Formalising Stakeholder Context using SysML v2	Paper
Powering Mission-Driven MBSE: SysML v2 and Simulation-Enabled Trade Studies for a Solar-Powered Aircraft	Paperless presentation
An LLM- and Knowledge-Graph - Based Framework and Tool for Automated SysML v2 Model Generation from Natural Language	Paper

Summary of SysML v2 Content at IS26

Title	Type
MBSE workflow leveraging SysML v2 for mission-centric Manned - Unmanned Teaming (MUM-T), aligned with the DoD Mission Engineering process	Paperless presentation
From Architecture to Analytics: Operationalizing the Mission Engineering Guide with SysML v2	Paperless presentation
Finding Wa in the Workflow: How SysML v2 and DevOps Tooling Enable Agile Systems Engineering	Paperless presentation
Unified Architecture Framework (UAF) Version 2: Status, Evolution, and Roadmap	Reserve/Poster
Assessing Technical Measures using SysML V2	Reserve/Poster
SysML v2 based MBSE and MBD Harmonization	Reserve/Poster
Model Exchange Formats for SysML v1 and SysML v2 in Distributed Engineering Environments	Reserve/Poster

SysML v2 Content at IS26: Saturday/Sunday Tutorials

- Writing Queries in SysML v2
 - Sean Densford (Dassault Systemes)
 - Tutorial demonstrating several use cases for creating queries to parse SysML v2 models, including counting the number of specific kinds of model elements in the model or model elements meeting certain criteria, and filtering elements to populate views.

SysML v2 Content at IS26: Monday

- Gen AI enabled Dependent Failure Analysis using SysML V2 pipeline for mixed safety criticality SDV Platform architecture
 - Nilesh Behera, Amruta Karekar and Yutika Patwardhan (Tata Consultancy Services)
 - Presentation (#359) on a method leveraging generative AI to aid the safety assessment of system architectures expressed in SysML v2 using an example application of an automotive emergency braking capability subject to automotive safety certification standards
- Enabling Seamless OEM-Supplier Collaboration through the SysMLv2 API: A Model-Based Systems Engineering Approach for inter-organisational information exchange
 - Alexander Busch, Alexandre Luc and Lars Kosmann (Ansys/Synopsis)
 - Presentation (#342) demonstrating the use of the SysML v2 API to facilitate synchronization and collaboration both directly utilizing the REST API and via a Python wrapper around the API.

SysML v2 Content at IS26: Monday

- A Multi Agent Approach to Validating Systems Models
 - Qiana Curcuru and Ethan Cox (MIT Lincoln Labs)
 - Paper (#36) on a framework for SysML v2 model validation via a multi-agentic modeling tool, which was implemented in a prototype that demonstrated significant improvement in productivity in requirement derivation and relationship discovery tasks.
- A usage first modelling methodology in SysML v2
 - Tommie Liddy (Turen Pty Ltd) and Matthew Wylie (Shoal Group Pty Ltd)
 - Paper (#166) on the exploration of a SysML v2 modeling methodology that uses a minimum of definitions, relying instead almost exclusively on usage elements, and proposes criteria for guiding SysML v2 modelers in choosing when to use definitions.

SysML v2 Content at IS26: Tuesday

- Lifecycle Interoperability for eVTOL System Design Using a SysML v1 to v2 Digital Thread
 - Cameron Krivitsky and Conor Byrne (SBE Vision)
 - Presentation (#83) demonstrating a PLM system centric implementation of digital threads connecting SysML v1 and v2 models, requirements, and PLM artifacts all residing in separate tools.
- Model-Driven Engineering for Modeling and Simulating Satellite Power Systems: A Case Study
 - Daijin Hu, Yilong Yang, Peiye Yang and Jingwei Shang (Beihang University)
 - Paper (#419) presents a case study that demonstrates the use of SysML v1 and v2 in the MagicGrid framework for a satellite power system application.

SysML v2 Content at IS26: Tuesday

- AI-Supported Engineering Automation Through Integrated Systems Modeling With SysML v2: A Use Case Showing Challenges and Opportunities in Modern Mechatronic System Development
 - Gerolf Schalk, Mathias Dreier, Michael Tatschl, Yannick Hemmeter, Stefan Kollegger, Stefan Goetz, Sandro Wartzack and Hannes Hick (Graz University of Technology)
 - Paper (#189) presents a model-centric automation architecture that leverages AI agents and the SysML v2 API to facilitate data exchange across disciplines
- SysML v2 as the Glue: Scalable MBPLE with a System-Driven Feature Approach
 - Marco Bimbi (Mathworks) and Tim Weilkiens (oose)
 - Paper (#271) presents an approach for variability management in product line engineering (PLE) leveraging SysML v2 and its API and contrasts it with the traditional PLE approach

SysML v2 Content at IS26: Tuesday

- Executable Multidisciplinary Workflows Lowering Barriers to MBSE: Validating a Middle-Out MDAO-led Adoption Strategy through STOP Analysis
 - Yusuke Onishi, Pranjal Sharma and Vishal Naik Bolnekar
 - Presentation (#375) demonstrating an MBSE/DE methodology that integrates SysML v2 architecture models with multi-disciplinary analysis and optimization (MDAO) provided by the Ansys ecosystem of tools to enable integrated Structural Thermal Optical Performance (STOP) analysis
- From Architecture to Analysis: Is the SysML v2 API the Missing Link Between MBSE and Simulation?
 - Alexander Busch, David Hetherington, Tim Weilkiens, Luca Boggero and Erik Herzog
 - Panel discussion focusing on the value and challenges of SysML v2's API and Services specification as a mechanism for enabling greater interoperability and integration of system modeling and simulation to achieve the promise of MBSE

SysML v2 Content at IS26: Wednesday

- Closing the V-Cycle: A SysML v2 - Aligned MBSE Co-Simulation Workflow for Autonomous eVTOL V&V
 - Pranjal Sharma, Manabu Ishikawa, and Vishal Naik Bolnekar
 - Presentation (#424) demonstrating a digital thread implementation that integrates SysML v2 architecture models with embedded software code or Functional Mockup Units, perception algorithms, vehicle dynamics models, and a mission scenario model
- MBSE and simulation-based development for automotive mixed criticality systems
 - Motohiro Shibakawa, Nicolas Ochoa-Lleras, Akihito Iwai, and Hasan Esen
 - Presentation *#143) on a digital thread implementation that integrates SysML v2 system models with Functional Mockup Interface models for simulation, and a concurrency coordination language called Lingua Franca, applied to an Automated Valet Parking application

SysML v2 Content at IS26: Wednesday

- SysML v2 as Serialization Format for Avionics Development
 - Bojan Lukic, Josh Kahn, Nirmallya Kundu, Becky Petteys and Umut Durak
 - Paper (#153) demonstrating SysML v2 to facilitate data interoperability by two mechanisms:
 - 1) an interactive API (SysML interactive parser imports the model, converts to JSON, and exports the versioned data, adding universal ID to model elements) integrated in MATLAB and System Composer
 - 2) an Xtext parser that imports the model into a native Xtext representation, parse it with defined primitives, perform verification that the model correctly parses, and export a JSON or other format file

A SysML V2 Modeling Pattern for Recursive System Decomposition

- Sanford Friedenthal and Andrew Muxen
- Paper (#180) describing the recursive decomposition pattern being developed in a partnership between the INCOSE Object Oriented Systems Engineering Method (OOSEM) Working Group and the OMG System Modeling Community to establish standardized modeling patterns to establish a foundation for consistent and interoperable modeling to advance the maturity of MBSE

SysML v2 Content at IS26: Wednesday

- Top 10 Failure Modes in MBSE & Digital Engineering Programs - and How SysML v2 Helps (and Sometimes Hurts)
 - Saulius Pavalkis (Dassault Systemes)
 - Presentation (#38) on the top 10 ways in which organizations fail to achieve value from MBSE adoption, and how SysML v2 alleviates some of these dysfunctions, including: 1) treating the model as little more than a document; 2) overmodeling, with too much detail; 3) disconnected silos within the model; 4) absence of behavior execution; 5) broken digital thread; 6) overemphasis on modelers' needs rather than stakeholders' decision needs; 7) premature chasing of standards and tools; 8) misaligned stakeholder expectations; 9) the missing value loop, lacking a concrete outcome that each model element must contribute to; and 10) missing or ineffective governance.

SysML v2 Content at IS26: Wednesday

- Towards Formalising Stakeholder Context using SysML v2
 - Matthew Harrison, John Carlin, Chengyuan Liu, Sarah Dunnett and Siyuan Ji
 - Paper (#270) by Loughborough University on a reference architecture to map Soft Systems Methodology (SSM) elements to SysML v2 model elements to formalize the process of eliciting and capturing stakeholder context to contribute to and be added to a system architecture model.
- Powering Mission-Driven MBSE: SysML v2 and Simulation-Enabled Trade Studies for a Solar-Powered Aircraft
 - Alexander Busch, Kamran Memon, Rajagopalan Badrinarayanan and Meredith Basso
 - Presentation (#343) on an MBSE workflow that connects requirements and architecture in SysML v2 models to mission-level simulation, orchestrated by ModelCenter and leveraging the System Modeling API.

SysML v2 Content at IS26: Thursday

- An LLM- and Knowledge-Graph - Based Framework and Tool for Automated SysML v2 Model Generation from Natural Language
 - Jinli Chen, Haochen Zhang, Alexey Sedoykin, Yuri Konstantinov, Dmitri Kopanев, Alexey Shamanaev, Dmitry Gladkov, Huicai Lan and Shuiping Qiu
 - Paper (#472) on a framework for using AI integrated with knowledge graphs to generate SysML v2 models from natural language inputs, and experimental comparison of this approach with general and fine-tuned LLMs without the benefit of knowledge graphs
- MBSE workflow leveraging SysML v2 for mission-centric Manned - Unmanned Teaming (MUM-T), aligned with the DoD Mission Engineering process
 - Dongho Lee, Kyunghun Jeon and Sanghun Choi
 - Presentation (#253) on a mission engineering workflow based on SysML v2 architecture models coupled with simulations to calculate MoP, MoE, and MoS

SysML v2 Content at IS26: Thursday

- From Architecture to Analytics: Operationalizing the Mission Engineering Guide with SysML v2
 - Meredith Basso, Yusuke Onishi, Kyunghun Jeon, Vincenzo Maria Vitale, Moraya Prabhu and Himangshu Bora
 - Presentation (#148) on a mission engineering approach based on SysML v2 models emphasizing behavior execution of the architecture synchronized with quantitative simulation tools
- Finding Wa in the Workflow: How SysML v2 and DevOps Tooling Enable Agile Systems Engineering
 - Zeke Brechtel and Steve Massey
 - Presentation (#457) on the adaptation of DevOps workflows to MBSE by leveraging the SysML v2 textual notation and software-like continuous integration practices facilitated by SysGit and GitLab

SysML v2 Content at IS26: Reserve Papers/Posters

- Unified Architecture Framework (UAF) Version 2: Status, Evolution, and Roadmap
 - Aurelijus Morkevicius
 - Presentation (#55) on the status of UAF V2 development, highlights key updates to the metamodel, demonstrates SysML V2 extensions (as UAFML is being implemented as a comprehensive SysML v2 model library), and outlines the roadmap for future evolution
- Assessing Technical Measures using SysML V2
 - Daniel Cobb, Tori Hawkins, Jai Sosa and Christina Stovall
 - Paper (#400) on an MBSE approach for capturing a system's technical measures in SysML v2 models to facilitate tracking and evaluation of those measures during system development, demonstrated on the INCOSE/OMG Cubesat system reference model

SysML v2 Content at IS26: Reserve Papers/Posters

- SysML v2 based MBSE and MBD Harmonization
 - Takashi Nakazawa, Takafumi Suzuki, Bharani Raj Mohan and Hisashi Miyashita
 - Paper (#41) on the integration of MBSE and model-based design (MBD) that leverages SysML v2 and State Space Representation (SSR) and significantly reduces the need for manual data synchronization between descriptive and analytical models, demonstrated in a Vehicle to Everything (V2X) application
- Model Exchange Formats for SysML v1 and SysML v2 in Distributed Engineering Environments
 - Chris Klotz
 - Presentation (#491) on model exchange formats and mechanisms available in SysML v1 and v2 in Dassault Systemes' Teamwork Cloud environment and their implications for model sharing and configuration management