

CONCEPT DESIGN & ENGINEERING CUSTOMER PANEL DISCUSSION

Detroit MI – Oct 11th, 2022

As we work closely with our customers to support the development of innovative products, we also understand their challenges. These challenges are associated with increased competition, supply chain issues, sustainability, and daily technological advances that disrupt the marketplace.

Simultaneously time to bring the product to market is shrinking drastically, while the consumer requirements have increased, and the risk associated with failure is significantly higher.

Design and Engineering leaders have recognized this and are focused on ensuring requirements are well defined and available during the concept phase. They continually explore ways to ideate, iterate and evaluate design concepts that meet these requirements and address any infeasibilities.

Such a mindset ensures the selection of the best & innovative concept design, which can quickly migrate through detailed stages of development with limited risk of failure and costly redesign.

Join us with our Panelist to collaborate and know more about their experiences



John Cooper
DeLorean Motor Company



Jorgen Hilmann
Ford Motor Company

Subbi Pisupati
Stellantis

CONCEPT ENGINEERING FOR EFFICIENT STRUCTURES DEVELOPMENT – JOURNEY AND VISION



Since many years CATIA SFE CONCEPT has been the leading solution and industry standard for early phase simulation-driven conceptual design. It allows creating and modifying implicitly parametric surface models fast and efficiently. The unique paradigm of the attributive single-layer geometry ensures a high performance - even when handling large structures like an entire automotive body structure or even bigger.

The 3DEXPERIENCE platform provides organizations a holistic, real-time view of their business activity and ecosystem, connecting people, ideas, data and solutions together in a single environment. Integrated design and simulation, also known as Modeling and Simulation (MODSIM), provides design and analysis engineers the advantage of experiencing their design. By applying simulation to the earliest phase of design it's possible to accurately predict, compare and simulate multiple product behaviors and maintain a digital continuity from the concept to detailed phase of the design.

Join us for the next step in our concept engineering journey as CATIA SFE CONCEPT technology is integrated into the 3DEXPERIENCE platform

PRESENTERS



Manohar PRABHU
Dassault Systemes



Matthew PAIS
Dassault Systemes



Architecture CAE

Concept Modeling @ FORD | 2001 | 2011 | 2021 | 2031?"

Topics:

- Centralized build
- SFE CONCEPT & Libraries
- Concept Correlation
- Agile Process
- Systemic exploration



Jorgen Hilmann
Ford Motor Company

CONCEPT STRUCTURE ENGINEER INTRODUCTION



Concept Structure Engineer is a paradigm shift compared to the traditional applications leveraged to product design. It unifies the implicitly parametric nature & single-layer geometry features from SFE CONCEPT with the best-in-class CATIA surface modeler, providing a familiar functionality & look and feel to all Designers.

It creates a greenfield for innovation by providing design & engineering teams access to generate concept models at a rapid pace, which can be evaluated and further iterated through unified simulation and process applications from SIMULIA on the 3DEXperience Platform.

The power of the CATIA Geometric modeler enables seamless transition from Concept to Detailed design and also provides an opportunity to leverage CATIA V5 data supporting co-existence.

Learn more about this technology in this introductory presentation.

PRESENTERS



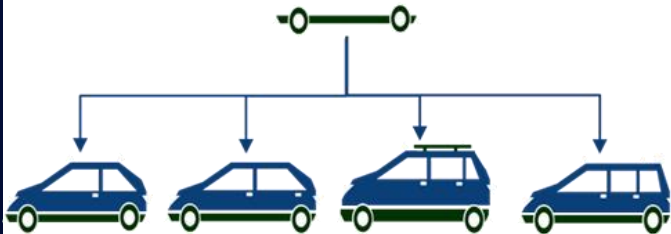
Emir TOUAJNI
Dassault Systèmes



Anup ITI
Dassault Systèmes



CONCEPT VEHICLE ARCHITECTURE EXPLORATION



Identifying the right architecture that can be repurposed for multiple vehicle variants is strategically important for automotive manufactures trying to reduce time to market & consolidate engineering effort.

We can imagine two kinds of data. A detailed body model, which achieves computational accuracy but very complex and expensive for iterative studies. The other one is a simplified architecture concept model that simulates the basic layout and general structural behavior of major load-carrying members in the body. Such models are valuable for CAE validated design directions in the earliest phases of the vehicle development process.

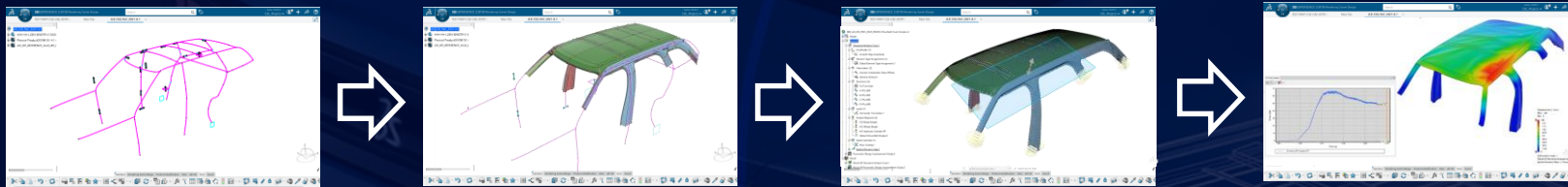
This demo focusses on the second type, Parametric Architecture Concept (PAC) Models, which will leverage global vehicle parameters for exploration across multiple variants, modularization techniques and a combination of detailed and concept design, to support design and simulation studies through multiple phases.

PRESENTER



Prateek PATIL
Dassault Systemes

PARAMETRIC DESIGN AND STRUCTURAL OPTIMIZATION FOR EARLY DESIGN EXPLORATION



See how Jaguar Land Rover put the 3DEXPERIENCE to the test on a demanding use case integrating design creation and automated simulation-driven performance optimization. 3DEXPERIENCE Concept Structure Engineer enters the market as a next generation end-to-end solution for accelerated innovative concept design. We applied it to design a vehicle roof in minimum time and to optimize its crash behavior.

PRESENTERS

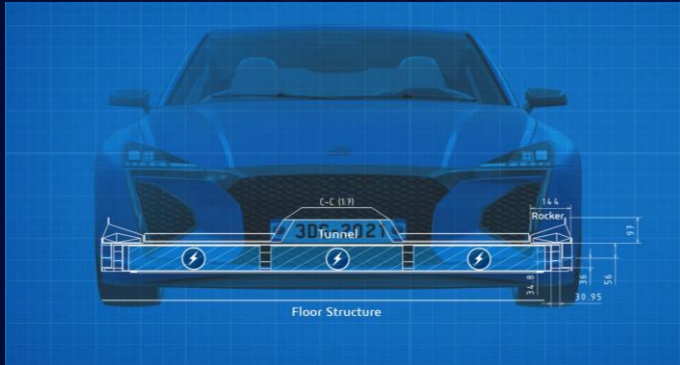


Dr. Tayeb Zeguer
Jaguar Land Rover



Stefan MERTZ
Dassault Systemes

INTEGRATED REQUIREMENTS, MODELLING & SIMULATION FOR BATTERY PACK STRUCTURE



Design data for structures in the concept stage is incomplete and evolving. For efficient design, important decisions must be made rapidly (sometimes in hours). Traditionally, the lack of precise 3D design data makes it challenging to apply FEA during this stage which can cause significant issues to be passed along to the detail design phase, where it may be expensive to fix. In addition, there is a lack of synchronization between system and subsystem objectives which may cause a waste of time due to users working on outdated designs & requirements, which will lead to high overheads.

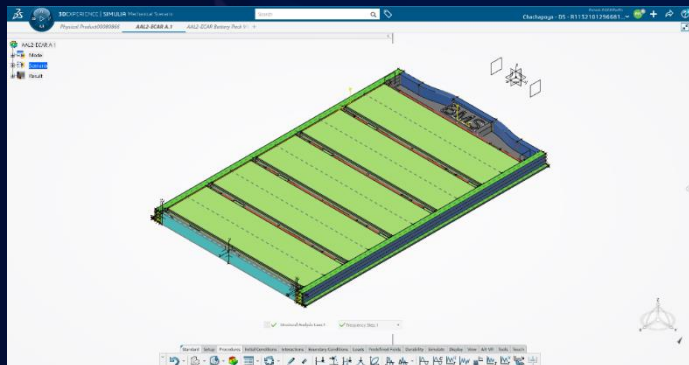
In this presentation, we will showcase a unified workflow to evaluate requirements originating from system models and then applied to structural design and simulation with full traceability from requirements to simulation KPIs, all in a single environment. This level of synchronization is essential for the development of next-generation mobility, which is meeting consumer requirements.

PRESENTER



Ashish AGGARWAL
Dassault Systemes

CONCEPT STRUCTURE ENGINEER HANDS ON SESSION



Experience for the first time, latest technology developed by CATIA and SIMULIA, which unifies Modeling & Simulation for the conceptual design and exploration of structures.

Concept Structure Engineer, on the 3DEXPERIENCE Platform from CATIA, is a complete, end-to-end, concept design and engineering solution, connected to our Modeling & Simulation initiative.

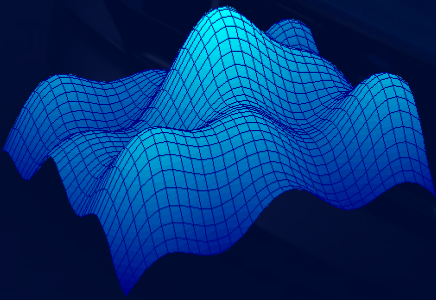
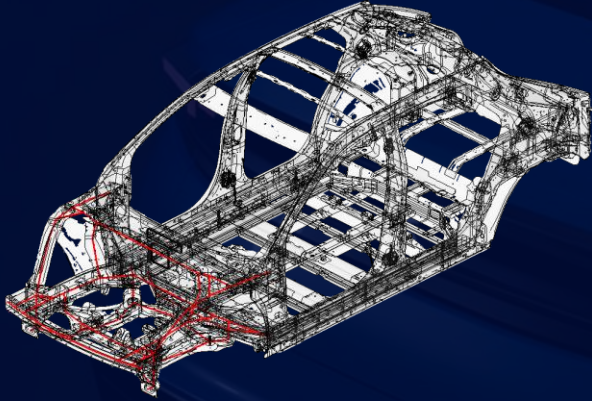
You can seamlessly start from upstream engineering inputs, and quickly create parametric models, through a modular approach for future reuse. With less time spent 'prepping' models, we are able to swiftly move through a variety of alternative designs, through SIMULIA's Parametric Design Study to see which alternatives pass or fail as the engineer moves the product along in the design process.

PRESENTER



Raj SINGH
Dassault Systemes

CONCEPT STRUCTURE OPTIMIZATION FOR CRASHWORTHINESS



Optimizing a vehicle structure for crashworthiness in the early concept design phase is challenging since the design evolves frequently, and the simulation takes too long to meet the design changes' frequency. Therefore, we need a workflow to follow the design changes and provide timely feedback.

Hence, we performed a PoC (Proof of Concept) project collaborating with Dassault Systèmes SIMULIA to explore the workflow that optimizes a structure using an abstracted model and a metamodel. We then verify the design with a few runs of an FE model using an algorithm that makes the FE model run faster

PRESENTERS

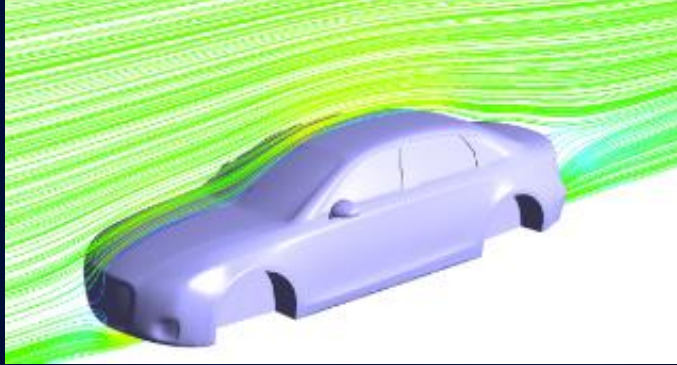


YongHa HAN
Hyundai Motor Group



Yangwook CHOI
Dassault Systemes

CONCEPT AERO-FLOW & STRUCTURAL EXPLORATION



Vehicle Styling is one of the most important factor, which determines the commercial success of a particular vehicle. Styling also plays a significant role in the performance of the vehicle, based on its aero profile and has strong influence on design space available to develop an underlying structure, which meets key structural performance targets.

Concept phase provides an opportunity, for early feasibility to study the impact of styling on structural design and different multi-physics, but this interaction remains unexplored because of lack of tools, which could leverage early data.

In this presentation, we will demonstrate the power of common geometry modeler across different CATIA applications, which will bring styling and conceptual design together further executing multi-physics simulation and exploration by leveraging SIMULIA applications, to validate functional requirements

PRESENTERS :



Shravan MUMMADI
Dassault Systemes



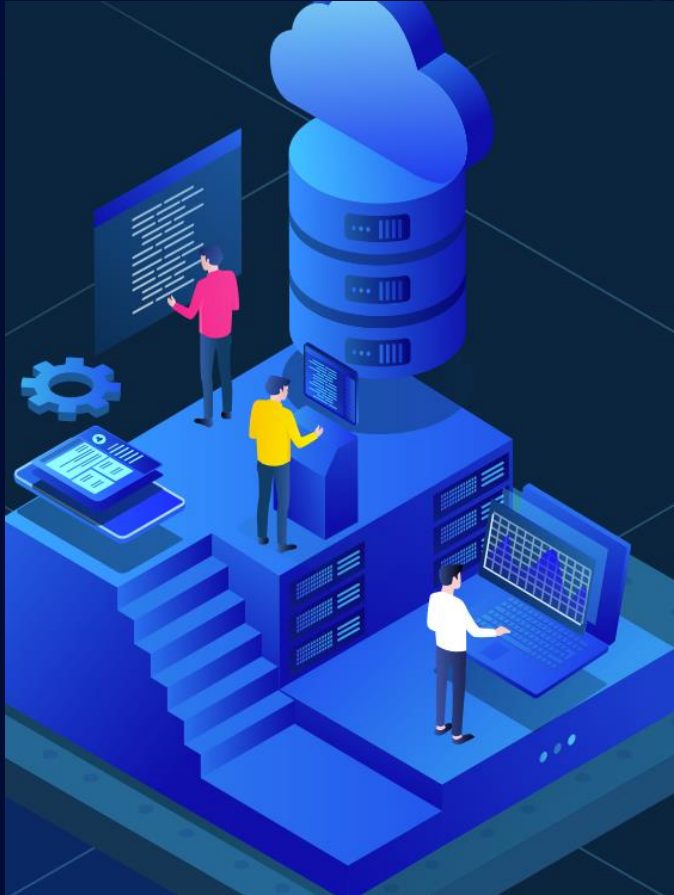
Tristan DONLEY
Dassault Systemes



Balaji RAMANATHAN
Dassault Systemes



MODELING & SIMULATION - R&D UPDATES



Emir TOUAJNI, CATIA Concept Engineering MODSIM Roles Portfolio Manager & Christina FEIST, R&D Technologies MODSIM Exploration Apps Portfolio Director, will share vision and provide updates for the future development of the Modeling and Simulation Portfolio.

PRESENTERS



Emir TOUAJNI
Dassault Systemes



Christina FEIST
Dassault Systemes

PANELIST - CONCEPT



John Cooper **Senior Director, Vehicle Engineering and Validation,** **DeLorean Motor Company**

John Cooper is the Senior Director of Vehicle Engineering and Validation at DeLorean Motor Company. With nearly 45 years of experience, he has a significant background in EV startups and has successfully created two startup companies of his own. A deep understanding of growing companies and an accomplished career in engineering gives John a multifaceted perspective. Having also had the unique experience of profit and loss responsibility in a CEO role, John is able to support the financial success of the company by making cost-effective decisions as an engineer.

He is responsible for managing global certification, safety system integration, testing, NVH, vehicle attributes as well as performing vehicle simulation (CAE/CFD/vehicle dynamics) on new vehicles at DeLorean Motor Company.

When the EV space piqued his interest in 2012, John joined Tesla Motors as the Head of Vehicle Engineering CAE and Passive Safety. Responsible for all full-vehicle crash, occupant safety, durability, and fatigue analysis on the Model S and Model X, John played a pivotal role in the production of both vehicles from concept to delivery.

His next notable role was at Karma Automotive where he served as the Director of Safety and Vehicle Engineering and later as Vice President of Vehicle Integration, Vehicle Engineering, and Safety. During his three-year tenure at Karma, John oversaw safety, testing, and CAE for all Karma platforms, and aided in the Revero 1.0 and 2.0's launch to market.

Previous experiences also included chassis, powertrain, and transmission products for Cummins, GKN Technology, and Lotus Engineering; Director of Safety Systems and Integration at Breed Technologies, now Joyson Safety Solutions; CEO of TASS International; Vice President of Virtual Products at Denton ATD; Executive Director for Global Engineering Services at Key Safety Systems; Chief Engineer CAE and Safety at Mahindra North America; and Head of Vehicle Integration, CAE, and Passive Safety at Indi EV.

John received his Bachelor's Degree in Mechanical Engineering from Teesside University in Middlesbrough, England. John has over twenty patents related to Automotive. He is originally from England and is fluent in English and German.

PANELIST



Dr. Jørgen Hilmann **SV ArchitectureCAE | Concepts & Analytics**

Jørgen started his career in 2001 doing his Diploma Thesis on the evaluation of SFE Concept for the safety attribute.

Over the next ten years he worked in pre-programs ranging from small passenger cars to large commercial vehicles. As safety engineer and changed the way how the concept phases worked implementing a process using SFE Concept as central tool to deliver x-functional CAE models from the same source.

In 2008 the PhD Thesis on Structural Optimization was completed, which demonstrated shape, gauge and grade variables using SFE Concept.

As task leader and supervisor a small team was formed, which took a global role in standardizing and shaping the work in this phase and focusing x-attribute: Core activities have been: A centralized documentation the concept modeling, as well as the architecture attribute work, optimization and data analytics.

The Proof of Concept for CSE (Concept Structure Engineer) is one major focus of his work, beside the daily business.