

automotive **CAE**²⁰¹⁸ **GRAND CHALLENGE**

April 17 – 18, 2018
Congresspark Hanau
Germany

Challenge
Electromobility

// **CAE GENERAL:** CAE PROCESS SUPPORTING THE
DEVELOPMENT OF PHYSICAL PROTOTYPES

// **CRASH:** OVERLOAD AND CRASH BEHAVIOR OF BATTERY PACKS

// **DURABILITY:** FATIGUE ANALYSIS OF PLASTICS AND COMPOSITES

// **MATERIALS:** FAILURE MODELS FOR CAST ALUMINUM PARTS IN CRASH

// **NVH:** PREDICTION OF ENGINE AND GEAR NOISE OF ELECTRICAL DRIVES

// **OPTIMIZATION:** ROBUST DESIGN THROUGH NUMERICAL ANALYSIS

// **SAFETY:** MESHING, FOLDING AND PRE-PROCESSING OF AIRBAGS

// **PARTNER WORKSHOPS:**

BETA CAE // ASC(S) // DYNARDO // DATADVANCE

CAE-based product development

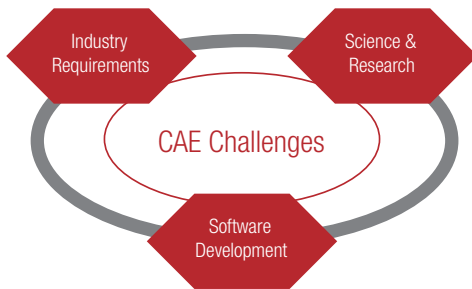
In the last 20 years computer simulation has become an indispensable tool in automotive development. Tremendous progress in software and computer technology makes it possible today to assess product and process performance before physical prototypes have been built. Applications of computer simulation cover nearly all aspects of product and process design.

Challenges in virtual vehicle development

Despite of significant progress in simulation technology and impressive results in industrial application there remains a number of problems which prevent a "100% digital prototyping".

Automotive CAE Grand Challenge as a platform for exchange

The automotive CAE Grand Challenge stimulates the exchange between users, scientists and software developers in order to solve these challenges. Annually the current challenges in automotive CAE are being identified through a survey among simulation experts of the automotive industry. In the conference one session is dedicated to each of the most critical challenges, the "Grand Challenges". In each session CAE experts from industry, research and software development explain the importance of the individual Challenge for the virtual development process and report about their efforts to solve the challenge.



Grand Challenges 2018

In September 2017 we determined the critical current challenges of automotive CAE - the so-called "Grand Challenges". The below „Grand Challenges“ form the topics of the sessions of our automotive CAE Grand Challenge 2018 conference:

- ▶ **CAE general:** CAE process supporting the development of physical prototypes
- ▶ **Crash:** Overload and crash behavior of battery packs
- ▶ **Durability:** Fatigue analysis of plastics and composites
- ▶ **Materials:** Failure models for cast aluminum parts in crash
- ▶ **NVH:** Prediction of engine and gear noise of electrical drives
- ▶ **Optimization & robustness:** Robust design through numerical analysis
- ▶ **Safety:** Meshing, folding and pre-processing of airbags

PARTNER WORKSHOPS

APRIL 17: 11.00 - 12.30 | CONFERENCE ROOM 5

BETA Simulation Solutions
„Post- Processing simulation results
in Virtual Reality“



The purpose of the workshop is to demonstrate the state of the art in simulation result visualization by META, the post-processor of BETA CAE Systems.

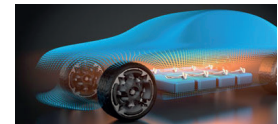


APRIL 17: 13.30 - 17.00 | CONFERENCE ROOM 5

asc(s) SimpulseDay
„Virtual Testing for Improved Safety and
Performance of Electric Vehicles“



The goal of the workshop is to derive the need for action and lay the foundation for preparing new project proposals in the field of virtual test and validation methods.

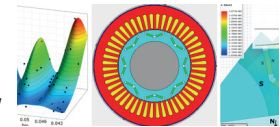


APRIL 18: 10.30 - 12.00 | CONFERENCE ROOM 5

dynardo optiSLang
„Robust Design Optimization for
Electromagnetic Applications“



Learn how to control large parameter spaces in electromagnetics through the optiSLang philosophy of meta-model-supported sensitivity analysis and optimization.



APRIL 18: 13.30 - 15.00 | CONFERENCE ROOM 5

DATADVANCE Software
„Design Space Exploration in Virtual Vehicle Development“



DATADVANCE shows how to automate simulation workflows that take into account different multidisciplinary effects and the overall system behavior.



09.00 h Welcome
Dr.-Ing. Dirk Ulrich - carhs.training gmbh

Parallel Sessions 9.00 - 13.00 h

LOCATION: BRUEDER GRIMM SAAL

CRASH: OVERLOAD AND CRASH BEHAVIOR OF BATTERY PACKS


Chair: Mark Gevers, TECOSIM

Industry

09.30 h Battery Modelling for Crash Simulation
Richard Peter Brown - Jaguar Land Rover Ltd.

Research

10.00 h Testing and Simulation of the Crash Characteristics of Li-ion Batteries for safe Vehicle Integration
Werner Leitgeb, Dr. Alexander Thaler - Kompetenzzentrum - Das virtuelle Fahrzeug, Forschungsgesellschaft mbH; Christoph Breitfuß - Technische Universität Graz

10.30 h Coffee and networking 

11.00 h Failure Criterion for Lithium-ion Batteries, Implementation and Validation
Dr. Elham Sahraei Esfahani - GMU George Mason University & MIT - Massachusetts Institute of Technology; Marian Bulla - Altair Engineering GmbH

Solutions

11.30 h Assessing Battery Safety using a combined Simulation Approach from Cell to Vehicle Level
Dr. Bernhard Brunnsteiner - AVL LIST GMBH

12.00 h Prismatic Cells in Crash Simulation: Recent Developments and Future Prospects
Alexander Sporbert - IAT Ingenieurgesellschaft für Automobiltechnik mbH; Lars Hollmotz - StrategicSupport Dienstleistungs UG; Dr. Oliver Schoeneich - IAT Ingenieurgesellschaft für Automobiltechnik mbH

12.30 h Lunch Break 

LOCATION: CONFERENCE ROOM 1-4

CAE GENERAL: CAE PROCESS SUPPORTING THE DEVELOPMENT OF PHYSICAL PROTOTYPES


Chair: Alexander Diederich - Toyoda Gosei Europe N.V.

Industry

09.30 h CAE Driven Design of Prototypes to support early Development Phases
Dr.-Ing. Robert Schilling, Dr.-Ing. Axel Hänschke - Ford-Werke GmbH

Research

10.00 h Optimization of ultra-lightweight BIW Design
Nikolai Kharaldin, Prof. Dr. Alexey I. Borokov - CompMechLab Ltd.; Mikhail Aleshin - Saint-Petersburger Politechnical University; Oleg Klyavin - CompMechLab Ltd.

10.30 h Coffee and networking 

Solutions

11.00 h Elimination of Full Car Prototypes in Automotive thanks to CAE Driven Design
Dr. Nicolas Vallino - Groupe PSA; Dr.-Ing. Kamila Flidr - Altair Engineering GmbH

11.30 h A Framework for objective Multi-Attribute Evaluation of Vehicle Components
Dr. Carlos López Rodríguez, Bart van Doninck, Jan Stroobants, Suzanne van Poppel - Flanders Make vzw

12.00 h A.I.-assisted Engineering
Steffen Slavetinsky, Dr. Stefan Suwelack - Renumics GmbH

12.30 h Lunch Break 

MEETING POINT



Meet the speakers at our Meeting Point! Take the opportunity to discuss and share your individual issues.

LOCATION: BRUEDER GRIMM SAAL

MATERIALS: FAILURE MODELS FOR CAST ALUMINIUM PARTS IN CRASH

Chair: Achim Fellhauer, TRW



Industry

13.30 h Challenges in introducing Cast Aluminium in Full Car Crash Simulation
Dr. Johan Jergeus - Volvo Car Corporation

Research

14.00 h Characterization and Application of a Damage Approach for cast Aluminium Alloys
Christian Mühlstätter - AIT Austrian Institute of Technology GmbH

14.30 h Characterization and Modeling of the Damage Behavior of an Aluminium Casting Alloy taking Porosity Distribution into Account
Dr. Dong-Zhi Sun, Dr. Florence Andrieux - Fraunhofer-Institut für Werkstoffmechanik IWM

15.00 h Coffee and networking  

Solutions

15.30 h Current Modeling Approach for the Failure Prediction of cast Aluminium under Crash Loadings in LS-DYNA
Dr. Filipe Andrade - DYNAmore GmbH - Gesellschaft für FEM Ingenieurdienstleistungen; Dr. Markus Feucht, Joseph Kauss - Daimler AG

16.00 h Material and Failure Modelling of Alu Castings with RADIOSS
Marian Bulla - Altair Engineering GmbH

16.30 h New Development in Selection and Optimization of Material Properties
Prof. Dr. Viktor Pocajt, Petros Michos - Key to Metals AG

LOCATION: CONFERENCE ROOM 1-4

NVH: PREDICTION ENGINE AND GEAR NOISE OF ELECTRICAL DRIVES

Chair: Lars Eilers - GNS mbH

Industry



13.30 h To be announced

Research

14.00 h NVH correlation Criteria and their Application in Model Updating
Jan Hendrik Elm - fka Forschungsgesellschaft Kraftfahrwesen mbH; et al.

Solutions

14.30 h Electric Drive Noise and Vibration Analysis
Thomas Liebernickel - Dassault Systemes Deutschland GmbH

15.00 h Coffee and networking  

15.30 h A fully digital CAE-based multi-disciplinary Development Environment for Virtual Sound Design of EVs/HEVs
Dr. Alfred J. Svobodnik - MVOID Group | MVOID Technologies GmbH

16.00 h Vibration and Equivalent Radiated Power in the Process of Electric Drive Simulation
Dr. Martin Hanke - CADFEM GmbH

16.30 h NVH Simulation Process for E-Drive Systems
Helmut Dannbauer, Oliver Grieshofer, Walter Hinterberger - Magna Powertrain ECS GmbH & Co. KG

17.00 h Coupled Electromagnetic-Acoustic Simulations of the In-Wheel Electric Motor
Uroš Rožic, Dr. Martin Stojnik, Krištof Rener, Matic Frajnkovic - Elaphe Propulsion Technologies Ltd

LOCATION: BRUEDER GRIMM SAAL

SAFETY: MESHING, FOLDING AND PRE-PROCESSING OF AIRBAGS

Chair: Dr. Zhengnong (Bill) Feng - Jaguar Land Rover Limited

Industry


08.30 h Airbag Pre Processing – Handcraft or Software aided Model Creation?
Dr. Lars Aschenbrenner - Volkswagen AG

Research

09.00 h To be announced

Solutions

09.30 h Airbag Folding using Generator4, a Generic Process
Christoph Kaulich, Carsten Thunert - GNS Gesellschaft für numerische Simulation mbH

10.00 h Coffee and networking 

10.30 h Introducing JFOLD - a Simulation based Airbag Folding System for LS-DYNA
Shinya Hayashi - JSOL Corporation; Richard Taylor - Arup, c/o JSOL

11.00 h New Influence Parameter in Airbag Simulation
Jutta Schlosser - ESI Engineering System International GmbH; Christian Listner - TAKATA AG

LOCATION: CONFERENCE ROOM 1-4

DURABILITY: FATIGUE ANALYSIS OF PLASTICS AND COMPOSITES

Chair: Dr.-Ing. Beate Lauterbach - Opel Automobile GmbH


Industry

08.30 h Fatigue Simulation of Plastics – is it possible?
Mads Werner Nielsen, Andrew Blows, Dr. Mark Blagdon - Jaguar Land Rover Limited

Research

09.00 h A Continuum Damage Mechanics Model for Fatigue Assessment of FRP Materials
Zalikhha Murni Abdul Hamid, Dr. Monika Gall, Dr. Jörg Hohe - Fraunhofer-Institut für Werkstoffmechanik IWM

09.30 h Presentation title to be announced
Fraunhofer LBF

10.00 h Coffee and networking 

Solutions

10.30 h Structural Durability Analysis Process of Short Fiber Reinforced Plastic Components
Helmut Dannbauer, Dr. Christian Gaier, Stefan Fischmeister - Magna Powertrain ECS GmbH & Co. KG

11.00 h Fatigue Simulation of a Short-Fiber-Reinforced Oil-Filter Housing under realistic Load Conditions using the Master SN-Curve Approach
Dr. rer. nat. Michael Hack - Siemens Industry Software GmbH & Co KG; Dr. Wolfgang Korte - PART Engineering GmbH; Dr.-Ing. Matthias Teschner - MANN+HUMMEL GmbH; Dr. Stefan Straesser - Siemens Industry Software GmbH & Co KG

MEETING POINT

Meet the speakers at our Meeting Point! Take the opportunity to discuss and share your individual issues.

Plenary Session 12.00 h - 17.00 h

LOCATION: BRUEDER GRIMM SAAL

GUEST SCIENTIST

11.30 h Nonlinear Response Structural Optimization using Equivalent Static Loads Method
Prof. Dr. Gyung-Jin Park - Hanyang University

OPTIMIZATION & ROBUSTNESS: ROBUST DESIGN THROUGH NUMERICAL ANALYSIS

Chair: Prof. Dr.-Ing. Fabian Duddeck - Technical University Munich

Industry

12.00 h Robustness Analysis and Identification of relevant Structural Parameters for the Small Overlap Crash Test
Ivan Cuevas-Salazar, Lailong Song - BMW AG; et al.

12.30 h Lunch Break 


Research

13.30 h Robust Design through Numerical Analysis - Research State of the Art
Prof. Dr.-Ing. Axel Schumacher - University of Wuppertal

14.00 h ITEA VMAP Project - Working on a Standardisation of Material Data Interfaces in CAE Workflows
Klaus Wolf, Gino Duffet - Fraunhofer Institut SCAI

Solutions

14.30 h Analysis Methods for Robust NVH Design
Dr. André Backes - TECOSIM Technische Simulation GmbH

15.00 h Coffee and networking 

15.30 h Robustness Optimization within the Development Process through Integration of Manufacturing Tolerances in the Simulation
Clément Hayer - Volkswagen AG; Dr. Sierk Fiebig, Jürgen Schellschopp - Volkswagen AG; Werk Braunschweig; Prof. Dr.-Ing. Thomas Vietor - Technical University Braunschweig

16.00 h Robust Design Optimization for Electromagnetic Applications
Markus Stokmaier, Michael Schimmelpfennig, Dr. Roland Niemeier - Dynardo GmbH

16.30 h Robust Design Optimization of a Charge Air Cooler
Dr.-Ing. Reinhard Helfrich, Andreas Schünemann - INTES GmbH

17.00 h Summary & Farewell
Rainer Hoffmann - carhs.training gmbh

REGISTRATION

- Yes, I will attend the **Automotive CAE Grand Challenge 2018** on April 17 - 18, 2018. The registration fee is **EUR 980** (until March 20, 2018, thereafter EUR 1,180).
- Yes, I will attend the **BETA CAE Workshop** on April 17, 2018 (free).
- Yes, I will attend the **asc(s) Workshop** on April 17, 2018 (free).
- Yes, I will attend the **optiSLang Workshop** on April 18, 2018 (free).
- Yes, I will attend the **DATADVANCE Workshop** on April 18, 2018 (free).

Title	First Name
Name	
Department	
Phone	
E-Mail	
Company	
Postcode/City	
Address	
Invoice to	
Date/Signature	

Terms & Conditions

The registration fee excludes VAT. It includes detailed conference proceedings as pdf files on a USB flash drive, lunches, refreshments and the evening reception. The registration fee is due 10 days after invoicing. Free cancellation is possible until 4 weeks before the beginning of the event. Participants who cancel later than 4 weeks before the event but earlier than 2 weeks before the event are liable for 50% of the registration fee. Participants who cancel later than 2 weeks before the event, or who do not attend, are liable for the entire registration fee. The number of participants is limited. carhs.training gmbh reserves the right to vary or cancel the event in the light of bookings and to vary the duration and content without prior notice. In the event of cancellation, carhs.training gmbh will refund all monies paid to carhs.training gmbh with respect to the event. The program is subject to change without notice. **Universities and public research institutes receive a 40% discount on the registration fees.**

The automotive CAE Grand Challenge 2018 - The event in automotive CAE you should not miss:

- ▶ Learn all about the current challenges of automotive CAE
- ▶ The only CAE conference for which the conference topics are determined by a survey among the experts in automotive CAE
- ▶ Hear all about the efforts in research and software development to overcome the challenges of automotive CAE
- ▶ Meet researchers, software developers and industrial users during the conference, in the exhibition and at the evening reception

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EXHIBITORS

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