

PRESENTATION PROGRAM OVERVIEW

Monday, October 5th, 2026

18:00	Welcome Reception & Opening Exhibition in the Kurhaus	Poster Presentation online and 1st Floor at Kurhaus		
	GROßER SAAL	LESESAAL	KONFITOREI	ERFRISCHUNGSRaum

Tuesday, October 6th, 2026

08:30	Opening Plenary Session			
10:45	ICE I	Advanced E/E Platforms	AI Trends in Mobility	Commercial Vehicles
13:30	Plenary Discussion: Where is AI Really Driving the Automotive Industry?			
14:35	Strategy I	H2 ICE	AI based Development	Drive Systems I
16:35	ICE II	Strategy II	AI Application	Automotive Start-Ups

Wednesday, October 7th, 2026

08:00	Charging & Battery Systems I	Autonomous Shuttle	AI in Fleet	Sustainability
10:00	Future Powertrains	Fuel Cell I	AI driven Functions I	Drive Systems II
11:05	Plenary Session			
13:45	Fuel Cell II	Battery Systems II	AI driven Functions II	Hybrid Powertrains
15:50	Closing Plenary Discussion: From Hype to Impact: AI in Automotive Development and Organizations			

CONFERENCE SCHEDULE

Welcome & Introduction to the 35th Colloquium

08:30



Univ.-Prof. Dr. rer. nat. Dr. h.c. mult

ULRICH RÜDIGERRector
RWTH Aachen University

Univ.-Prof. Dr.-Ing

LUTZ ECKSTEINInstitute Director
ika, RWTH Aachen University

Univ.-Prof. Dr.-Ing

STEFAN PISCHINGERInstitute Director
tme, RWTH Aachen University

Univ.-Prof. Dr.

SEBASTIAN TRIMPEExecutive Director
AI Center, RWTH Aachen University

Opening Plenary Session

08:40



Dr.

MANFRED HARRERPresident & Head of R&D Division
Hyundai Motor Group**CARSTEN HELBING**Co-CEO and COO
Rivian and Volkswagen Group
Technologies**TAKASHI UEHARA**President Powertrain
Toyota

PRESENTATIONS

Tuesday, October 6th, 2026

10:45 - 11:15

GROßER SAAL

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KONFITOREI

ERFRISCHUNGSRAUM

ICE I

Advanced E/E
Platforms

AI Trends in Mobility

Commercial Vehicles

Lamborghini Temerario
GT3, pure racing soul of
a biturbo V8 engine

The intelligent Car

Causal Continuity:
The Role of Domain-
shifted Foundation
Models in the
Automotive Industry

Development of
Hydrogen Engine
Vehicles Integrated
with Toyota's Hybrid
System for Light
Commercial Vehicles

D. Bizzarri, L. Bombace, L. Rizzi,
P. Scarpato, A. Staine, E. Ursitti
Automobili Lamborghini

M. Tietze
BMW Group

F. Wegner
Mistral AI

Y. Ikeda, Y. Haruna, K. Ito,
M. Toya, H. Ueura
Toyota Motor Corporation

11:15 - 11:45

Contributing to the
Environment through
Negative Emissions
using ICEs with a
Simple Exhaust System

Next evolution of a
versatile iDM platform
with high value 5th
generation inverter

AI-driven forecasting
of electric vehicle DC
fast charging behavior

Multi-objective
Optimization of Electric
Drivetrains regarding
Commonality Aspects
for Diverse Truck
Portfolios

K. Harada
Mazda Motor Corporation

M. Ishihara
BorgWarner, Inc

R. Doel, A. Chandra, W. Jones,
C. Kersov, K. Rieger-Grothaus,
A. Yerudkar
Shell Research

P. Hätscher
Daimler Truck AG

11:45 - 12:15

Improved Creep Life
Prediction of
Turbocharger Turbine
Wheels Using Measured
Operating Temperature
and Grain Size Effect

Design of a PCB-
Embedded GaN
Power Module and Its
Application in Next-
Generation Hybrid
Powertrains

FEV GenAISys: A Multi-
Objective AI-Integrated
Platform for Use-Case-
Driven Virtual BEV
Concept Development

Humanoid Chauffeur

A. Asano
Toyota Motor Corporation

Y. Ma, P. Hu, C. Yu, C. Lin,
L. Guo, H. Wei, F. Zhao
Horse Powertrain Ltd.

C. Wellmann
RWTH Aachen University
B. Chen, X. Klingbeil, T. Plum,
R. Savelsberg, L. Schäfers,
M. Struth, A. Kothari - FEV
J. Andert - MMP, RWTH Aachen
University

L. Eckstein - VDI.eV.
C. Peters - VDI.eV.
S. Klautt - fka GmbH

PRESENTATIONS

Tuesday, October 6th, 2026

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KONDITOREI

ERFRISCHUNGSRaum

13:30 - 14:30

Plenary Discussion: Where is AI Really Driving the Automotive Industry?



TIM GUTHEIT
VP Technology &
Innovation Automotive
Infineon



WILL VAN DER AALST
Chief Scientist
Celonis



ANTONIO KRÜGER
CEO
DFKI

14:35 - 15:05

Strategy I

The digital transformation of the automotive sector - how can Europe get back in a lead position

M. Lemke
European Commission

H2 ICE

The Pre-ignition Experimental Development of a Cummins 6.7L Spark Ignited Direct Injection Hydrogen Engine

L. Liu
CUMMINS

AI based Development

Simulation Technology and Its Application to xEV Driving Control Development with AI Support

T. Kaminaga, H. Kaneko,
T. Morikawa
Toyota Motor Corporation

Drive Systems I

Huawei DriveONE: Full-stack solution for new energy vehicle power domain

J. Ghosh, C. Shi
Huawei Technologies Duesseldorf GmbH
C. Chen, X. Shi
Huawei Technologies Co, Ltd.

15:05 - 15:35

Germany's Productivity Imperative: Where AI and Advanced Tech Create Real Shopfloor Leverage

J. Berking, T. Braun,
H. Engelstädter, S. Huber
Oliver Wyman GmbH

Injecton System Design for Homogeneous and Lean Combustion in Hydrogen Engines

A. Yamaguchi, J. Weber,
D. Queck, J. Zanger
DENSO CORPORATION

Next-Generation CAE: Leveraging Data-Driven Workflows for Virtual Development

M. Blomberg, D. Lückmann,
B. Morcinkowski - FEV Europe GmbH
H. Habib - Key Ward GmbH
M. Lückerrath - tme, RWTH Aachen University

Challenges in Drive System Development for Autonomous Vehicles - Illustrated by the Volkswagen Nutzfahrzeuge ID. Buzz AD

N. Hartnack, M. Bigalke, C. Grothe
M. Schendel, W. Siebert
Volkswagen Nutzfahrzeuge

15:35 - 16:05

A new compass - New Business Models for Automotive Suppliers

C. Koehler
H&Z Group

SubZero Cold Start of a Novel 6.6L H2 PFI V8 Engine: Experimental Assessment of Coordinated Ignition and Injection Strat

R. Russo, R. Aprosio, G. Gallo,
B. Maisola, M. Ravazzolo,
N. P. Sacco, T. Spedicato,
G. Stirpe, A. Zingariello - Dumarey Automotive Italia
A. Di Nieri - Dumarey Softronix Srl

How Expensive Is AI Coding? Measuring Energy and Emissions

L. Casella, T. N. Vartziotis,
M. Herrnberger, M. Keckeisen
TWT GmbH Science & Innovation

Permanent magnet synchronous machine with amorphous core and heavy-rare-earth free magnets for traction applications

M. Schröder, D. Gerstgarbe - FEV
H. Currimbhoy - mmp, RWTH Aachen University

PRESENTATIONS

Tuesday, October 6th, 2026

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ERFRISCHUNGSRAUM

ICE II

Strategy II

AI Application

Automotive Start-Up

Start-Up Pitches and discussion
featuring contributions from:

The new Mercedes-Benz V8 M177 Evo: Concept and Engineering Features of a High-Performance V8 to Meet Future Emission Reg

F. Weinert, H. Buchfink, T. Eder,
S. Henke, W. Holly, S. Müller,
S. Schlegel, S. Schmitt, R. Weller,
F. Weinert, M. Werner
Mercedes-Benz AG

Humanoid Robots 2.0

J. Zinn, W. Bernhart, C.-S. Ernst,
T. Kirschstein
Roland Berger GmbH

From Software to Intelligent Experience: Agentic AI and Virtualization Accelerating SDVs

F. Bankoley
Robert Bosch GmbH

Building an Agentic Intelligence Layer for Industrial Robotics
C. Susen - Athenyx Robotics GmbH

Beyond Generative AI: The emerging role of Industrial AI to Solve Complex Physical Engineering Challenges
S. Shepherd - Monumo

From Vehicle Fault Data to Preventive Action: AI and Knowledge Graphs in Catena-X
J. Kukulies - textelligence GmbH

Accelerating Open-Source Innovation in Automated Driving
T. Wopen
Thinking Cars GmbH

Lithium Metal Anodes for Next-Generation Batteries
H. Minis Pai - Skellium

Cost Efficient Hybrid with Variable Transmission Ratio for Small Offroad Vehicles
M. Jakoby - NAIXT Solutions GmbH

New Dimension Driving Experience
K. Graf - Race-by-Wire GmbH

Building an Agentic Intelligence Layer for Industrial Robotics
D. Ruf - leitspalt GmbH

Boxer meets Battery – The Next Stage of the 9A3 Engine Family in the new 911 Turbo S

M. Wunder, T. Fruth, C. Pleuß, F. Steimle, T. Wasserbach,
M. Wessels, M. Wunder
Dr. Ing. h.c. F. Porsche AG

China's Fast Lane vs Europe's Engineering: How AI Could Redraw the Race

M. Nievelstein
strato7

Large-Scale Demonstration and AI – Taking the next steps on automated driving in Europe

A. Etemad
Volkswagen AG

The Effect of Mid-Level Ethanol Blends on Fuel Economy, Performance, Emissions, Reliability, and Well-to-Wheel CO₂

N. Matsubara, M. Aoki,
K. Kodama, M. Kojima, T. Koyama,
Y. Ochi, K. Sugata, K. Tomoda
Toyota Motor Corporation

Transformation by Design: Shaping Human-Centric R&D Organizations, Augmented by AI

P. Glusk
FEV Consulting

Autonomous Driving in Europe: From testing to type-approval

F. Clos
TÜV Rheinland Kraftfahrt GmbH

16:35 - 17:05

17:05 - 17:35

17:35 - 18:05

PRESENTATIONS

Wednesday, October 7th, 2026

	GROßER SAAL	LESESAAL	KONDITOREI	ERFRISCHUNGSRAUM
	Charging & Battery Systems I	Autonomous Shuttle	AI in Fleet	Sustainability
08:00 - 08:30	Thermal Optimisation Approaches to Reduce Heat Losses during Fast Charging J. Krings, S. Belsser, P. Steinmetz, P. Ziegler - Daimler Truck H.-C. Reuss - FKFS Stuttgart	xCritc: A Learned Scene-Agnostic Critic for Autonomous Driving Evaluation M. Gier Zoox	Battery Foundation Models and Agentic AI for Scalable E-Bus Fleet Optimization U. Genc, C. Kurtulus, C. Yavas Eatron Technologies	The strategic momentum of circularity – how it reshapes the automotive industry A. Klos EFESO MANAGEMENT CONSULTANTS
08:30 - 09:00	Megawatt Charging Experience D. Liebig, A. Chmura, F. Heider Shell Global Solutions (Deutschland) GmbH	From Heilig's Blechle to the Container: How Virtual Testing Bridges Vehicle and Cloud N. Eckstein, A. Osterrieder Bertrandt Group	Holistic TCO-Based Optimization for Mixed ICEV/BEV/FCEV Heavy-Duty Fleet Operations T. Koch, L. Eckstein Ika, RWTH Aachen University	Mastering the EU powertrain transformation: new business opportunities and ramp-up strategies. L. Mauler, L. Hoffmann, C. Prié Porsche Consulting GmbH
09:00 - 09:30	High Voltage, High Risk? Functional Safety in 800 V+ Systems L. Fautz, M. Balah, G. Bilkei-Gorzo fka GmbH	Small but mighty - Closing the gaps in your mobility network M. Zwick INYO MOBILITY GMBH	A re-calibration of Robotaxi: operational model, technical breakthrough, and supply chain Y. Yang - Yole Group	Challenges and Opportunities in Hydrogen Fuel Cell Technology : Insights from Real-World Data D. Kim HYUNDAI MOTOR COMPANY

PRESENTATIONS

Wednesday, October 7th, 2026

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Future Powertrains

Fuel Cell I

AI driven Functions I

Drive Systems II

Technology Scaling in
xEV Electrification

Key factors for a high
performance FC stack
– efficiency &
robustness as drivers
for reliable systems up
to 500 kW

Multi Attribute
Optimization of an
Electric Vehicle Chassis
Architecture for
Dynamics, Durability,
and NVH Performance

The all new Electric
Drivetrain from
Mercedes-AMG

K. Jang
HYUNDAI MOTOR COMPANY

J. Kraft, A. Beeckmann, F. Claß,
P. Eppe, N. Zsiga
EKPO Fuel Cell Technologies
GmbH

A. Carlitz, S. Chakraborty,
K. Krishnamoorthi, D. Lickfold,
M. Siddegowda
Lucid Motors

D. Blanusa, T. Gödecke
Mercedes-AMG GmbH

Intelligent Efficiency
and Maximum
Performance of the
Mercedes-Benz EQS

The all new FC system
for HD trucks:
Significant TCO
improvements due to
its dedicated long-
haul truck layout &
design

AI and Camera-Based
In-Cabin Sensing:
Shaping the Future of
Vehicle Interiors

Temperature sensor
virtualization to
improve cost-
effectiveness of
electric machines

M. Weiss, O. Vollrath, G. Paul, L.
Henle, N. Waldbüßer, D. Hopp, C.
Dörr
Mercedes-Benz AG

T. Braun, J. Blum, N. Held,
S. Hollnaicher, N. Loughlan,
N. Weidler
cellcentric

T. Rehfeld
Aptiv

C. Hahn, D. Gross, M. Gupta,
R. Keck, S. Paulus, M. Schenk,
Y. Xu
Robert Bosch GmbH

Plenary Session



SHEN YUAN
Vice President and CTO
Geely



**PRAKASH RAO
MALATHKAR**
Head of Product Development
Mahindra



ANDREAS NAUERZ
CPO
IONOS

PRESENTATIONS

Wednesday, October 7th, 2026

13:45 - 14:15

GROßER SAAL

Fuel Cell II

Customer Use Cases that Verify Market Need for New Technology at Scania

T. Sandberg
Scania CV AB

LESESAAL

Battery Systems II

Luce: The Heart of Ferrari's Electric Future – Battery Technology as a Performance Enabler

E. Ligabue
Ferrari

KONDITOREI

AI driven Functions II

Intelligent AI in Safety-Critical Embedded Software Development

B. O'Steen, S. Judge, N. Reinke,
M. Story, O. Tosh
Nexteer Automotive

ERFRISCHUNGSRaum

Hybrid Powertrains

GHG and local emission assessments for a democar running with a MtG fuel, a Hybrid Powertrain and an innovative ATS

C. Chaillou, C. Chaillou, E. Laigle,
T. Sarica - Aramco
V. Gaste - AVL LMM
M. Olteanu - HORSE Technologies
O. Coureau - RENAULT SAS

14:15 - 14:45

Collaborating to Advance Hydrogen Fuel Cell Technology

V. Chomel
Beyond Aero

AI for Efficient Traction Battery Lifecycle Development and Diagnostics

O. Breuer, F. Eitel, M. Gianoglio
Bernardi, J. Michaelis
Opel Automobile GmbH /
Stellantis

Reshaping ADAS Organizations for an End-to-End AI World: Aligning Regulation, Partnerships, and Technology

L. Bublitz
P3 Consulting GmbH

The Evolution of Blue Core: Integrating High-Efficiency Combustion with Advanced Electrification

G. Kirkpatrick
Changan UK R&D Centre

14:45 - 15:15

H2 Coach - Technology carrier: First Setra touring coach powered by fuel cell

D. Portmann
Daimler Buses GmbH
H. Mayer
Daimler Buses GmbH

Advancing Battery and EV Technology: Hyundai's Strategic Innovation

J. Seo
HYUNDAI MOTOR COMPANY

From Words to World: Leveraging the Power of AI for Scenario Generation

P. Peltzer, S. Klautt
fka GmbH

High Efficiency Range Extender (REX) and Dedicated Hybrid Engine (DHE) Solutions for Passenger Cars and Heavy Duty Vehicles

M. Wieser
AVL List GmbH

15:15 - 15:45

Experimental and simulative investigation on PEM Fuel Cell degradation mechanisms under automotive freeze start endurance

M. Schwarz, A. Albert - BMW Group
R.-A. Eichel - Forschungszentrum
Jülich GmbH, RWTH Aachen
University

Analysis of a Lithium-Metal Battery Cell for eVTOL Applications

S. Payandeh - FEV Europe GmbH
A. Aeverberg, S. Beschnitt,
J. Küpper, H. Löbberding,
M. Rudolph, M. Stapelbroek
FEV Europe GmbH

Transfer Virtual Validation from AD/ADAS to Powertrain

J. Pannek, N. Schade - ITL, TU
Braunschweig
S. Ehlers, T. Seel, B. Volkmann -
IMES, Leibniz University
Hannover

Learning Powertrain Intelligence: AI-driven REEV Control over Hardware Complexity

M. Sens, A. Fandakov,
J. Mickleit, P. Stracke
IAV GmbH

CLOSING PLENARY SESSION

Closing Plenary Discussion:

From Hype to Impact: AI in Automotive Development and Organizations

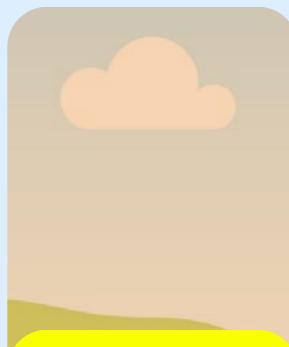
15:50



MARCO LICCARDO
Chief Technology & Digital Officer
IVECO



FRANK KALECK
Director Industry Advisory Automotive
Microsoft



PETER WALDMANN
VP Automated Driving
BMW AG



Dr. PETER HOLDMANN
Chief Technical Officer
ZF

Closing Remarks



Univ.-Prof. Dr.-Ing
LUTZ ECKSTEIN
Institute Director
ika, RWTH Aachen University



Univ.-Prof. Dr.-Ing
STEFAN PISCHINGER
Institute Director
tme, RWTH Aachen University

End of Colloquium

16:55

POSTER PRESENTATIONS

1

ANTJE MUNTZINGER

Hochschule für Technik Stuttgart

Teaching AI to Respect Physics: Robust Perception via Physics-Guided Learning

Modern perception systems for automated driving are highly capable, but AI models can still produce physically implausible outputs in challenging scenarios. This contribution presents a physics-guided learning approach to improve the robustness and reliability of camera-based environment perception for automotive applications.

2

GREGORIUS KRISNA CAHYANTO

Esslingen University of Applied Sciences

Optimization of emission behavior for a hydrogen combustion engine

Early concept decisions for high-performance vehicles rely heavily on KPIs such as acceleration performance and track capability, often before detailed development data is available. This paper presents a digital development process combining public competitor data, physics-based simulations, and machine learning to enable rapid KPI estimation and competitor benchmarking in early vehicle development.

3

VINCENT QUAST

IMSE, RWTH Aachen University

Retrieving information from system architectures in model-based systems engineering.

As the complexity of modern cyber-physical systems increases, model-based systems engineering (MBSE) is becoming essential for managing development processes and system information. This study presents an AI-based chatbot using a GraphRAG approach to access and utilize information stored in MBSE system models, improving accessibility and reducing complexity for stakeholders.

4

MATTHIAS MAY

IMSE, RWTH Aachen University

Bridging Requirements and Verification: An AI-Based Tool for Automated Test Case Generation

The development of automotive systems is becoming increasingly complex, making the transformation of requirements into robust test cases a major challenge. This contribution presents an AI-based tool that automatically extracts test-relevant information from requirements and MBSE system models to accelerate and improve the generation of structured, traceable test cases.

5

SIMON DEHN

IMSE, RWTH Aachen University

AI-based Formalization of Requirements and Generation of SysML v2 System Architectures

The increasing complexity of automotive systems and unstructured requirements creates significant manual effort in requirements engineering and system modeling. This work presents an AI-based methodology that transforms natural language requirements into consistent SysML v2 system architectures, enabling faster, more traceable, and automated MBSE workflows for automotive development.

6

MICHAEL PALOCZ-ANDRESEN

Leuphana Universität

Decreasing Emissions and Fuel Consumption by coupling OBD and OBM data with AI

The Euro 7 standard requires continuous real-world emissions monitoring over the vehicle lifetime, creating new challenges for cost-effective sensor systems. This contribution presents a hybrid AI-based approach combining MOX sensor signals, vehicle operating data, and machine learning to enable precise and economically attractive on-board monitoring of nitric oxide emissions and fuel consumption.

POSTER PRESENTATIONS

7

SEMIH AKBULUT

IMSE, RWTH Aachen University

Robust NVH-Design of EDUs

Electrified powertrains introduce new challenges for noise, vibration and harshness design. In contrast to conventional combustion engine drivetrains, electric drive units are characterized by high frequency tonal excitations from the electric machine and gear mesh, which can disturb the customer and influence the purchase decision. Therefore, the NVH behavior of EDUs must be considered during product development. However, detailed simulation and optimization loops are time consuming and difficult to integrate into early design phases. Therefore, design guidelines are needed to support robust EDU designs without extensive optimization studies.

8

ANDRÉ KULZER

IFS, Universität Stuttgart

Predictive Powertrain Health Care

Modern powertrains are becoming increasingly complex, making it more difficult to identify aging or faulty components that affect efficiency and emissions. Intelligent monitoring systems based on data science methods can help detect failures early, classify system conditions, and enable predictive maintenance or adaptive control interventions. Potential applications include SCR systems, turbochargers, batteries, and other powertrain components. Digital twins based on physical, semi-physical, or data-driven models can be used for condition monitoring and fault detection. The project aims to evaluate suitable AI and data science approaches with regard to prediction quality, computational effort, scalability, and transferability. Selected methods will then be applied exemplarily to specific components in order to predict maintenance needs and identify complex fault patterns.

9

JANINA FICHTNER

ika, RWTH Aachen University

Framework for Targeted Sampling for Testing Automated Driving Functions

Scenario-based testing has become the standard for validating automated driving systems (ADS). Sampling methods are used to generate test scenarios for the simulation-based testing of ADS. Sampling results in a result space that, based on the simulation tests, can be divided into pass and fail regions separated by the pass/fail boundary. The structure of the result space is unknown prior to sampling for both rule-based and AI-based ADS. A conceptual framework is presented to approximate the fail regions using defined criteria and, on this basis—as well as through an efficient combination of exploration and exploitation—to identify the pass/fail boundary. Since the presented framework is a concept based on a systematic analysis of the state of the art, the framework must be implemented and validated in a subsequent step.

10

LENNART REIHER

ika, RWTH Aachen University

Taking University Research to the Road: How ika is developing, testing, and operating the karl. Research Vehicle

The Institute for Automotive Engineering (ika) has recently built a new research vehicle for automated and connected driving nicknamed karl. Operating an automated research vehicle is inherently difficult, especially for an academic institution: an automated driving software stack has to be developed, its functionalities have to be tested, a research vehicle has to be built, a testing approval has to be obtained, efficient operation processes have to be in place, etc.; all in a continual manner and revolving around modern software engineering practices. With this presentation, we plan to give honest insights into how ika as a university institute is developing, testing, and operating karl. and its automated driving system, from simulation over test tracks to public road traffic.

POSTER PRESENTATIONS

11

OLAF GOEBEL

Hochschule Hamm-Lippstadt

Increasing the resilience of the energy sector through BEVs with REX

When a significant proportion of a country's passenger car fleet consists of BEVs, this fleet also accounts for a significant proportion of the country's electricity consumption. When there is a dark doldrums period (in German: "Dunkelflaute") in winter, BEVs worsen the electricity shortage. Therefore, electricity suppliers must maintain additional capacity of gas-fired power plants for BEVs, which only run for a few hours a year and have correspondingly high electricity production costs.

12

ROBIN REIMANN

TH Köln

AI based development of wheelhub motors for cars

When designing electric motors specifically for use as wheel hub motors in passenger cars, it is important to focus on various aspects in order to create the best motor for the respective application. For example, you might want to achieve a semi-suspended design for use in comfort applications or simply optimise for maximum torque. We have developed a process that uses AI to optimise a specific type of rim and brake system and automatically makes an AI-supported statement about the best design parameters in the available installation space. Another advantage of AI-supported development is the significant saving in simulation resources, as a precise forecast can be made on the basis of the training data. The possibility of a semi-suspended machine reduces the unsprung mass in the wheel, which enables better driving safety and stability and thus makes it easier to retrofit into an existing installation space.

13

TOBI ROCKSTROH

Shell

Shell Triple 10 Concept Car

On June 22nd, Shell unveiled its Triple 10 concept car, a ground-breaking proof-of-concept vehicle designed to establish a new design philosophy for the next generation of battery electric vehicles (BEVs). The vehicle meets three ambitious goals that Shell believe will underpin future mass-market electric mobility: Charge Faster - a sub 10-minute charge time, Go Further - 10-km/kWh economy, Drive Cleaner - a life cycle 10-tonne CO₂e footprint

The key to the Triple 10 car's performance is Shell EV-Plus thermal fluid. Unlike traditional cooling systems that use water-ethylene-glycol, Shell's dielectric fluid allows for direct immersion cooling of the battery and powertrain. Thanks to its unique properties the fluid can make direct contact with electrical components eliminating thermal bottlenecks and safely unlocking ultra-fast charging speeds of up to 24.5 km of range added per minute.

14

YUSA TOMBUL

mmp, RWTH Aachen University

Predictive Powertrain Health Care: From Data-Driven Component Analysis to System-Level Anomaly Detection

As electrified powertrains transition toward higher voltages and increasing system complexity, ensuring component and system reliability becomes critical. While data-driven modeling and machine learning methods show great promise, their applicability differs significantly across powertrain scales. This work investigates their potential through two distinct use cases: a component-level analysis of electric machine bearings and a system-level anomaly detection framework for fuel cell powertrains. At the component level, inverter-induced bearing currents pose a major risk to electric machine lifetime. A comprehensive framework combining test bench measurements with data-driven modeling is presented to capture stochastic bearing current behavior. Based on these insights, a control-based mitigation strategy utilizing a hybrid pulse-width modulation scheme is implemented and its effectiveness is experimentally validated.

REGISTRATION & CONFERENCE

REGISTRATION PROCEDURE

1 Registration



Get a 10% discount when you come as a group of five or more.

www.aachen-colloquium.com/registration

2 Receive confirmation by e-mail

3 Settle the invoice

4 Registration completion after Receipt of payment

PARTICIPANT FEE

All prices are **exclusive** of VAT

Full Participation on site: 1.690,- €

For groups of 5 or more people from the same company, we offer a 10% discount.

Day tickets for flexible participation:

include conference access, catering and event materials. The banquet can be added for 100,-€.

Day 1 Ticket 1115,- €

Day 2 Ticket 900,- €

Online: 845,- €

University members: 50% discount on all options

CONFERENCE DOCUMENTS

Licences for single or multiple use of the complete conference proceedings as well as individual presentations can be ordered via www.aachen-colloquium.com/proceedings

CONFERENCE OFFICE

Monday, Oct. 5th, 2026 04:00pm - 07:00pm

Tuesday, Oct. 6th, 2026 07:30am - 06:00pm

Wed., Oct. 7th, 2026 07:30am - 05:00pm

