

Worldwide unique electronics congress for passenger car, commercial vehicle and off-highway applications

## ELIV-MarketPlace 2022



### E/E in Mobile Machines

- Interoperability and Connectivity
- Automation of Systems of Working Machines with AI and Adapted Sensor Technology
- Autonomous Work

### E/E in Passenger Cars – Electrification

- Life Cycle Analysis
- Energy Management
- Battery and Charging Technologies
- Power Electronics and Electric Drives
- Model-based Development

### E/E in Passenger Cars – Architecture

- Development of SW Defined Vehicles
- E/E architecture – Engineering and Testing
- Hardware and Software
- Safety and Security
- Cloud and Communication

### E/E in Passenger Cars – Autonomous Driving

- Automated Driving in Practice
- AI in Automation
- Sensors and Electronics
- Intelligent Sensors and Maps
- Testing and Reliability

### E/E in Commercial Vehicles

- Automated and Autonomous Driving and ADAS
- Challenges of the Charging Infrastructure for Commercial Vehicles
- Connectivity (Hardware and Infrastructure)
- Digital Interior in Commercial Vehicle
- Automated Driving – Machine Learning and AI

Keynote-Speaker



**Jan Becker,**  
APEX.AI



**Prof. Dr.-Ing. Thomas Herlitzius,**  
TU Dresden



**Jean-Francois Tarabbia,**  
Continental

+ Exhibition

+ Change between the lectures possible at any time

+ World Cafés

### Listen to experts from:

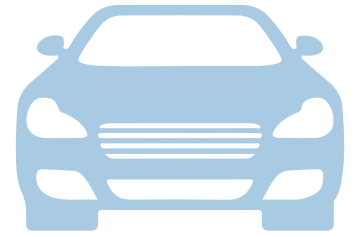
AGCO | Ansys Germany | APEX.AI | ARM Limited | Argus Cyber Security | AVL Software and Functions | BASELABS | Bosch Engineering | Bosch Management Support | CETITEC | CLAAS E-Systems | Continental Automotive Technologies | Daimler Truck | Elektrobit Automotive | Elmos Semiconductor | Fraunhofer-Institut für Experimentelles Software Engineering | FEV Consulting | FEV Europe | HELLA | Hillcrest Energy Technologies | INCHRON | Irdeto | Karlsruher Institut für Technologie | KPIT Technology | MAHLE International | MAN Truck & Bus | National Instruments | Navigation Data Standard | neocx | NNG Software | NNG | NXP Semiconductors Germany | P3 automotive | RWTH Aachen | Synopsys | Systematec | STMicroelectronics Application | TASKING | Technica Engineering | TU Dresden | Valeo Schalter und Sensoren | Vector Consulting Services | Vector Informatik | Volkswagen | ZF Friedrichshafen



## Program Committee Electric and Electronics in Passenger Cars



(FLTR)



**Dipl.-Ing. Reinhold Beck**, Head of EE Architectures and Concepts, Mercedes-Benz AG, Sindelfingen

**Dipl.-Ing. Simon Fürst**, General Manager Learning, BMW AG, Munich

**Steffen Glemser**, Senior Director Sales Automotive OEM, NXP Semiconductors Germany GmbH, Böblingen

**Dr.-Ing. Klaus Harms**, Consultant, Bosch Management Support GmbH, Stuttgart (chair)

**Dipl.-Ing. Martin Schleicher**, Head of Software Strategy, Continental AG, Erlangen

**Dr.-Ing. Michael Winkler**, CEO, Hella Fahrzeugkomponenten GmbH, Bremen

## Program Committee Electric and Electronics in Commercial Vehicles



(FLTR)



**Georg Fässler**, Vice President, Continental Automotive GmbH, Villingen-Schwenningen

**Volker Hansen**, PE SW & Electronics MB Trucks, Daimler Truck AG, Stuttgart

**Dr.-Ing. Falk Hecker**, VP Technology – Driver Assistance and Automated Driving, Knorr-Bremse Systeme für Nutzfahrzeuge GmbH, Schwieberdingen

**Dr.-Ing. Franz Krauss**, Director Commercial & Industrial (DISC) Software Center, ZF Friedrichshafen AG, Friedrichshafen

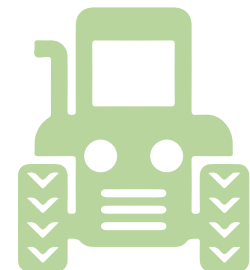
**Dipl.-Ing. (FH) Stefan Riegl**, VP Funktions- & Softwareentwicklung, MAN Truck & Bus SE, Munich

**Dr.-Ing. Hans-Josef Welfers**, formerly MAN Truck & Bus, Wegberg (chair)

## Program Committee Electric and Electronics in Mobile Machines



(FLTR)



**Dr. rer. nat. Alexander Flaig**, Head of Development Mobile Hydraulics, Bosch Rexroth AG, Elchingen

**Prof. Dr.-Ing. Thomas Herlitzius**, Chair of Agricultural Systems and Technology, Technische Universität Dresden

**Dipl.-Ing. Peter Hieronymus**, CLAAS E-Systems GmbH, Dissen a.T.W. (chair)

**Dr.-Ing. Carsten Hoff**, Managing Director, CLAAS E-Systems GmbH, Dissen a.T.W.

**Dipl.-Ing. Roman Hofmann**, Chief Engineer R&T, Liebherr-Elektronik GmbH, Lindau

**Dipl.-Ing. Jürgen Hollstein**, formerly John Deere – Tractor Electronics Ag & Turf Division, Mannheim

**Dipl.-Ing. Ralf Leinenbach**, Head of Technical Sales, HYDAC Electronic GmbH, Saarbrücken

## Scientific support

### VDI Society Automotive and Traffic Systems Technology

The VDI Society for Vehicle and Transport Technologies, VDI-FVT in short, has around 28,000 members that are affiliated to at least one of its 8 technical sections. This makes it the second biggest of the VDI's dedicated societies. VDI-FVT is the community for engineers working in the vehicle industry, as well as for engineers dealing with transport and traffic outside manufacturing industries.

Traditionally, a majority of members work in automotive. VDI-FVT is the German affiliate of the world federation of automotive engineers' societies, FISITA, and it is the intellectual sponsor of many big conferences on automotive technology and thus fosters exchange and knowledge transfer both nationally and internationally. It also sponsors Formula Student Germany, awarding VDI membership to all German participants, and promotes other student competitions for transport engineers. VDI-FVT has recently reconstituted technical sections for rail and marine technologies, as well as space and aircraft. It is putting a strong focus on transport and traffic in general and aims to mediate between technology and society.

[www.vdi.de/fvt](http://www.vdi.de/fvt)

## Program overview ELIV MarketPlace at a glance

### 1st Congress Day | Tuesday, November 15, 2022

- 09:00 Registration
  - 09:45 **Welcome and opening by the chairmen in the Auditorium (Basement)**
  - 10:00 **Realizing the smartphone on wheels: A task for the entire industry**  
Jean-Francois Tarabbia, MBA, Head of Architecture and Networking Business Area, Continental Automotive Technologies GmbH, Regensburg
  - 10:30 **Path to autonomous driving – Which challenges remain?**  
Jan Becker, CEO and Founder, APEX.AI, Palo Alto, CA, USA
  - 11:00 **Digital Transformation, 5G and Robotics for Mobile Machines – part of the solution or part of the problem?**  
Prof. Dr.-Ing. Thomas Herlitzius, Chair of Agricultural Systems and Technology, Technische Universität Dresden
  - 11:30 Coffee break
  - 12:00 **Overview and trends by the chairmen of the congress in the Auditorium (Basement)**
  - 12:45 Lunch break
- |         | Stream 1: E/E in Passenger Cars – Electrification<br>Auditorium (Basement) | Stream 2: E/E in Passenger Cars – Architecture<br>Forum (Ground floor) | Stream 3: E/E in Passenger Cars – Autonomous Driving<br>Kongresssaal I (1st floor) | Stream 4: E/E in Commercial Vehicles<br>Kongresssaal II (2nd floor) | Stream 5: E/E in Mobile Machines<br>Kongresssaal III (2nd floor) |
|---------|--|--|--|---|--|
| ● 14:15 | Energy Management  | Architecture/Engineering – Testing                                     | Autonomous Driving in Practice – Use Cases and Experiences                         | Alternative Drives & Power Electronics                              | Interoperability and Connectivity                                |
- 15:45 Coffee break
  - 16:15 **World Cafés on various topics in the Parkpavillon (Ground floor)**
  - 18:00 **End of the first Congress day**
  - from 18:30 **Get-together at the Kurhaus Baden-Baden**

### 2nd Congress Day | Wednesday, November 16, 2022

- 08:30 Summary of the World Cafés in the Auditorium (Basement)
- |         | Stream 1: E/E in Passenger Cars – Electrification<br>Auditorium (Basement) | Stream 2: E/E in Passenger Cars – Architecture<br>Forum (Ground floor) | Stream 3: E/E in Passenger Cars – Autonomous Driving<br>Kongresssaal I (1st floor) | Stream 4: E/E in Commercial Vehicles<br>Kongresssaal II (2nd floor) | Stream 5: E/E in Mobile Machines<br>Kongresssaal III (2nd floor) |
|---------|--|--|--|---|--|
| ● 09:00 | Battery and Charging Technologies  | Hardware   | AI for Autonomous Driving – Opportunities and Challenges                           | E/E-Architecture & Cyber Security                                   | Sensors for Automation and Autonomy                              |
| ● 10:30 | Coffee break   |  |  |   |  |
| ● 11:00 | Power Electronics and Electric Drives                                      | Safety and Security  | Sensors and Silicon  | Charging Communication & Infrastructure                             | Automation   |
| ● 12:30 | Lunch break  |  |  |   |  |
| ● 14:00 | Simulation for Automated Driving and Driver Assistance Systems             | Cloud and Communication  | Intelligent Sensors and Maps   | Autonomous Driving & Active Safety                                  | Autonomy   |
- 15:35 **Final discussion and summary by the chairmen in the Auditorium (Basement)**
  - 15:45 **End of the Congress**

## 5 good reasons why you should visit the event

1. Worldwide unique congress on the topic of electronics in passenger cars, commercial vehicles and mobile machines with focus on application and implementation.
2. Three conferences in one congress, five parallel sessions, a change between all lectures is possible at any time.
3. More than 400 experts meet every two years in Baden-Baden to obtain comprehensive information on trends and developments and to exchange information across all industries.
4. Large accompanying exhibition and exciting discussions at the World Cafés on current issues.
5. Joint evening event at the Kurhaus Baden-Baden for further exchange.

### 1st Congress Day | Tuesday, November 15, 2022

- 09:00 Registration
- 09:45 Welcome and opening by the chairmen in the Auditorium (Basement)
  - Dr.-Ing. Klaus Harms**, Consultant, Bosch Management Support GmbH, Stuttgart
  - Dr.-Ing. Hans-Josef Welfers**, formerly MAN Truck & Bus, Wegberg
  - Dipl.-Ing. Peter Hieronymus**, CLAAS E-Systems GmbH, Dissen
- 10:00 Realizing the smartphone on wheels: A task for the entire industry
  - End customers strive for a modern vehicle which is always up to date with the latest features, connected and easy-to-use
  - The vehicle of the future will be defined by SW and requires the vehicle E/E architecture to adapt
  - New architectures change how we develop technology, how we work together, and they demand new competencies in our project teams
  - New business models arise and establish again new forms of cooperation

**Jean-Francois Tarabbia, MBA**, Head of Architecture and Networking Business Area, Continental Automotive Technologies GmbH, Regensburg
- 10:30 Path to autonomous driving – Which challenges remain?
  - The role of end-to-end vehicle architecture
  - Modern automotive software development
  - Safety certification, legislation and regulations

**Jan Becker**, CEO and Founder, APEX.AI, Palo Alto, CA, USA
- 11:00 Digital Transformation, 5G and Robotics for Mobile Machines – part of the solution or part of the problem?
  - Digitization is not a standalone purpose, but serves automation
  - Construction 4.0 and Smart Farming combine machine automation with process and farm automation
  - How much added value does data offer and where does the value add take place?
  - How much autonomy is possible and how much operator should remain?
  - Is the operator a variable or a disturbance in automation?

**Prof. Dr.-Ing. Thomas Herlitzius**, Chair of Agricultural Systems and Technology, Technische Universität Dresden
- 11:30 Coffee break with visit to the exhibition
- 12:00 Overview and trends by the chairmen of the congress in the Auditorium (Basement)
  - Dr.-Ing. Klaus Harms** (Passenger Cars program)
  - Dr.-Ing. Hans-Josef Welfers** (Commercial Vehicles program)
  - Dipl.-Ing. Peter Hieronymus** (Mobile Machines program)
- 12:45 Lunch break with visit to the exhibition



Stream 1: E/E in Passenger Cars – Electrification	Stream 2: E/E in Passenger Cars – Architecture	Stream 3: E/E in Passenger Cars – Autonomous Driving	Stream 4: E/E in Commercial Vehicles	Stream 5: E/E in Mobile Machines
Auditorium (Basement)	Forum (Ground floor)	Kongresssaal I (1st floor)	Kongresssaal II (2nd floor)	Kongresssaal III (2nd floor)
<b>Energy Management</b> <b>Moderation:</b> Dr.-Ing. Klaus Harms, Bosch Management Support GmbH	<b>Architecture/Engineering – Testing</b> <b>Moderation:</b> Dr.-Ing. Michael Winkler, Hella Fahrzeugkomponenten GmbH	<b>Autonomous Driving in Practice – Use Cases and Experiences</b> <b>Moderation:</b> Dr. Rainer Holve, Elektrobit	<b>Alternative Drives &amp; Power Electronics</b> <b>Moderation:</b> Dipl.-Ing. (FH) Stefan Riegl, MAN Truck & Bus SE	<b>Interoperability and Connectivity</b> <b>Moderation:</b> Dipl.-Ing. Peter Hieronymus, CLAAS E-Systems GmbH
14:15 <b>Life Cycle Assessments as an engineers tool</b> <ul style="list-style-type: none"> <li>• Environmental balances as general requirement</li> <li>• Assumptions decide the result</li> <li>• Influence of technical advances</li> <li>• How results should be used</li> </ul> <p><b>Dr.-Ing. Olaf Toedter</b>, Head of Advanced Technologies and Ignition Systems, Sustainable drive systems research team, Co-authors: Philipp Weber, M. Sc., Prof. Dr. Thomas Koch, all of Karlsruher Institut für Technologie/IFKM, Karlsruhe</p>	<b>Virtual E/E Test Platform – co-exploration, optimization and validation of ECU architecture and software in the context of the car</b> <ul style="list-style-type: none"> <li>• Virtualization of electronics</li> <li>• Test automation</li> <li>• Simulation/SIL</li> <li>• HW/SW Optimization</li> </ul> <p><b>Andreas Ropers</b>, Director R&amp;D, System Design Group, Co-authors: Prof. Dr.-Ing. Andreas Hoffmann, Dr. Filip Thoen, Michael Hartmann, all of Synopsys Inc., Aachen</p>	<b>Next-Gen Sensor Fusion for Next-Gen Sensors and Driving Functions</b> <ul style="list-style-type: none"> <li>• Properties of current algorithms for sensor fusion and its related limitations</li> <li>• Improvements in detection and false alarm rate by integrated sensor fusion approaches enable next-generation driving functions</li> </ul> <p><b>Dr.-Ing. Eric Richter</b>, Director Technology Innovation, Customer Relations, Co-authors: Prof. Dr.-Ing. Andreas Hoffmann and Dr.-Ing. Marcel Markgraf, both of BASELABS GmbH, Chemnitz</p>	<b>New GaN based DCDC converter concept for future fuel cell and charging applications</b> <ul style="list-style-type: none"> <li>• High efficiency requirements for DC/DC converter especially in fuel cell application</li> <li>• Efficiency comparison of SiC and GaN based topologies</li> <li>• Increasing the power density of the DC/DC converter by higher switching frequency</li> </ul> <p><b>Manuel Raimann, M. Sc.</b>, Development Engineer, Engineering Power Electronics, ZF Friedrichshafen AG, Friedrichshafen</p>	<b>AEF Agricultural Interoperability Network</b> <ul style="list-style-type: none"> <li>• Network for agricultural cloud solutions and software providers</li> <li>• Digital and certified services, based on peer-to-peer communication</li> <li>• Harmonized technologies and standards</li> </ul> <p><b>Dipl.-Inf. Slawi Stesny</b>, Product Manager – On-board Connectivity &amp; Service Products, AGCO GmbH, Marktobendorf, Co-author: Andrew Olliver, B. Eng., CNHi International SA, Lugano, Switzerland</p>

**14:45 Benchmark of modern electrification concepts – Which powertrain topologies have the most benefits?**

- Overview of different e-axle configurations in today's electric vehicles
- Comparison of customer-relevant criteria
- Environmental impact of the powertrain topologies
- Trends within the industry

**Johannes Flemming, M. Sc.**, Technology Lead E-Motor & Power Electronics, P3 automotive GmbH, Stuttgart

**Event Chain Analysis as a Key Skill: Efficient Development of Software-Defined Vehicles**

- Mastery of the rapidly increasing technical complexity in the development of vehicles
- Requires major enhancements to the conventional development methodology
- Essential: Ensuring that all functional and timing requirements are met
- A comprehensive event chain based methodology for the efficient verification of the real-time behavior is presented

**Dr.-Ing. Ralf Münzenberger**, CEO, Co-author: Dipl.-Inf. Olaf Schmidt, both of INCHRON AG, Erlangen

**Quantification of Life-Saving Collective Perception V2X Benefits**

- Accident Analysis
- Vehicle-to-Vehicle-communication
- Vehicle-to-Infrastructure communication
- Vulnerable Road User Protection

**Dipl.-Wirtsch.-Ing. Bettina Erdem**, Market & Business Entry Strategies, Co-author: Harald Feifel, both of Continental AG, Frankfurt am Main

**Sustainable Trucking**

- From field test to series maturity: The innovation fleets
- The dual technology strategy
- The roadmap towards a zero emission product program

**Kevin Sammer**, Manager Zero Emission Projects Mercedes-Benz Trucks, Daimler Truck AG, Leinfelden-Echterdingen

**Standardization of interfaces and communication protocols in the context of construction machinery**

- MiC 4.0 – introduction and history
- Pain points of the digital construction industry
- Alleviation through existing standards
- An approach for the future

**Thomas Beck, B. Sc.**, Chairman Working Group System Architecture, Verband Deutscher Maschinen und Anlagenbau e. V. (VDMA), Frankfurt am Main

**15:15 Virtual Validation of Energy Management Strategies for E-Mobility with Model-Based Systems Engineering**

- Model-based systems engineering for the assurance of vehicle performance
- Design space exploration for energy management systems
- Early conceptual validation of energy management systems
- Compliance with consumption and driving performance targets

**Oliver Bleisinger, M. Sc.**, Team Lead, Model-Based Systems Engineering, em engineering methods AG, Darmstadt

**End-to-end Continuous Integration and Test, Software delivered from a cooperation portal into a compound test system**

- HPC projects drive the transformation of supply chains to supply networks
- High frequent integrations and tests on dedicated compound environments reduce project risks and costs
- An internet hosted collaboration platform allows dynamic project setups to share results and increases the transparency
- The CI approach across organizational boundaries presented here is a measure to mitigate the complexity

**Dipl.-Geogr. Jens Walther**, Solution Manager "System Infrastructure Services", Holistic Engineering and Technologies, Continental Automotive GmbH, Wetzlar, Co-authors: Sebastian Breitzkreutz, Volkswagen AG, Wolfsburg, Lars Dreißig, neocx GmbH, Dresden

**Lessons Learned from the current developments of highly automated driving functions (SAE Level 3 and 4) and derivation of future success factors**

- Review of previous development approaches, technical solutions and partnerships
- Critical assessment of status quo and achieved successes
- Open topics and challenges in the development of automated driving functions
- Best practices to optimize and close the identified gaps in R&D

**Dipl.-Ing. (FH) Marco Dargel**, Partner, Autonomous Mobility and **Lucas Bublitz, M. Sc.**, both of P3 Automotive GmbH, Stuttgart

Details about the speech will be published shortly before the congress.

**GAIA-X in the agricultural and food sector using the example of Agri-Gaia**

- Provision of a highly distributed B2B ecosystem for Artificial Intelligence incl. central marketplace for data and AI models
- Challenges of applying GAIA-X principles as an early adopter
- Exemplary applications in the agricultural and food industry
- Support for data management, model management, AI model management, and AI model development to multiple endpoints (edge/cloud deployment)

**Prof. Dr. Heiko Tapken**, Professor, Faculty of Engineering and Computer Science, Hochschule Osnabrück

15:45 Coffee break with visit to the exhibition

16:15 World Café

Topic 1: **Security, Data Security, Cyber Security for Autonomous Vehicles**

World Café

Topic 2: **Architecture & Component Availability**

World Café

Topic 3: **Standard Operating Systems in Conjunction with Virtualization**

World Café

Topic 4: **Human-Machine Interaction**

18:00 End of the first Congress Day

from Get-together

18:30 At the end of the first day, the VDI Wissensforum cordially invites you to a Get-together at the Kurhaus Baden-Baden. Come and talk to other participants and speakers and expand your network.



The World Cafés will take place in the Parkpavillon (Ground floor)!



**2nd Congress Day | Wednesday, November 16, 2022**

08:30 Summary of the World Cafés in the Auditorium (Basement)

**Stream 1: E/E in Passenger Cars – Electrification**

Auditorium (Basement)

**Battery and Charging Technologies**

**Moderation:** Dipl.-Ing. Steffen Kuhn, Elektrotbit Automotive GmbH

**Stream 2: E/E in Passenger Cars – Architecture**

Forum (Ground floor)

**Hardware**

**Moderation:** Dr.-Ing. Michael Winkler, Hella Fahrzeugkomponenten GmbH

**Stream 3: E/E in Passenger Cars – Autonomous Driving**

Kongresssaal I (1st floor)

**AI for Autonomous Driving – Opportunities and Challenges**

**Moderation:** Dipl.-Ing. Martin Schleicher, Continental AG

**Stream 4: E/E in Commercial Vehicles**

Kongresssaal II (2nd floor)

**E/E-Architecture & Cyber Security**

**Moderation:** Dr.-Ing. Franz Krauss, ZF Friedrichshafen AG

**Stream 5: E/E in Mobile Machines**

Kongresssaal III (2nd floor)

**Sensors for Automation and Autonomy**

**Moderation:** Dipl.-Ing. Ralf Leinenbach, HYDAC Electronic GmbH

09:00 **Future of Electrified Powertrain in the era of Software Defined Vehicles and Service Oriented Architecture**

- Challenges in EV charging implementation with evolving technologies and global standards
- What are needs and requirements from various actors in the EV charging ecosystem
- How Service Oriented Vehicle Architecture enables the future EV charging technology evolution

**Sophia Suo**, Vice President, Electrification, Co-authors: Ketan Doshi, Aniket Palkar, all of KPIT Technology, Novi, MI, USA/Pune & Bangalore, India

**Next generation SOC's for domain and zonal architectures. Implications for required semiconductors**

- Overview Domain and Zonal automotive E/E architectures
- Resulting requirements
- Impact on SoCs
- System solutions

**Dipl.-Ing. Stefan Singer**, Fellow & Senior Director, EMEA CAS Automotive, NXP Semiconductors Germany GmbH, Munich

**Understanding and Testing AI Decisions with Explainable AI**

- Software testing challenges with black box AIs
- Understanding and recognizing what AI decisions are based on
- Systematic analysis of an AI (use case study)

**Dr. rer. nat. Khanlian Chung**, Senior Software Development Engineer, Product Owner, Networks & Distributed Systems, Co-authors: Dr. Peter Ziegenhein, Gavin Rogers, all of Vector Informatik GmbH, Karlsruhe

**Supplier's Perspective of the Truck Architecture Transformation**

- Imminent truck architecture transformation due to increasing digitalization, automation & connectivity
- Challenge for Tier1 is to manage and consolidate the OEM approaches
- Identifying synergies and standards will enable re-use and thereby cost-effective solutions
- Software development environment with multiple partners is seen as key for success

**Dipl.-Ing. Günter Seidel**, Head of Technology Management, Smart Mobility R&D, Co-authors: Dipl.-Ing. Jörg Lützner, Dipl.-Ing. Thomas Smits, all of Continental Automotive GmbH, Villingen

**Technology comparison of environment sensors for mobile machines**

- Sensor technology and signal processing
- Possibilities and limits of AI
- Technology overview of camera, HD and IR camera, Lidar, ultrasound, radar
- Application examples from practice

**Prof. Dr.-Ing. Bogdan Franczyk**, Professor, Faculty of Economics, University of Leipzig

09:30 **An Advanced High-Efficiency SiC Inverter with High Switching Frequency to Improve Powertrain Performance**

- Effect of high switching frequency on the powertrain
- Limitations and challenges to achieve high switching frequency
- Challenges of Achieving Zero Voltage Switching (ZVS) inverter for wide operating range
- Introduction of new-generation ZVS inverter

**Ari Berger, M. Sc.**, Chief Technology Officer, Engineering, Co-authors: Dr. Jalal Amini, both of Hillcrest Energy Technologies Ltd., Vancouver, BC, Canada, Harald Hengstenberger, Systematec GmbH, Landsberg am Lech

**Targeted use of modern high-level languages, parallelization and acceleration options of an automotive Multi-Core Micro Controller**

- Challenges by the reuse of application software for single cores and its distribution across an multi core
- Heterogenous Multi-Core Microcontrollers provide accelerator functionalities that shall be used to improve the overall performance
- De facto standards ISO26262 and ISO21434 are mandatory and are required by all suppliers to be addressed
- Selecting the right supplier is a key differentiator for the success of the project

**Dipl.-Inform. Joachim Hampp**, Product Architect, Business Development and Innovation, TASKING Germany GmbH, Munich

**Big Data analytics for a seamless design flow of reliable automated driving functions**

- Complementary analysis methods for the entire life cycle of an automated driving function
- Powerful Processing and evaluation of large amounts of sensor and vehicle data
- New use cases for data analysis in the context of automated driving functions
- Application possibilities of Big Data Analytics during the operation of automated vehicles

**Nicole Kechler, M. Sc.**, Member of Scientific Staff, Co-author: Prof. Dr.-Ing. Eric Sax, both of Institut für Technik der Informationsverarbeitung (ITIV)/Fakultät für Elektrotechnik und Informationstechnik, Karlsruher Institut für Technologie, Karlsruhe

**Charging of battery electric trucks with more than 1 MW**

- E-truck requirement profiles
- Scalability of power electronics
- Modular control system
- Integration of energy storage

**Benjamin Langer, B. Eng.**, Head of Product line E-Drive and Innovation Management, AVL Software and Functions GmbH, Regensburg

**Experience report of technology transfer towards mobile machinery based on environment recognition systems**

- BirdView
- Mobile Machinery
- Technology Transfer
- Structure From Motion

**Dr. Andreas Hartel**, Head of Sensor Technology, Co-authors: Alexander Bertsch, Roman Hofmann, all of Liebherr-Elektronik GmbH, Lindau

**10:00 Tailored battery systems for entry level up to high performance applications**

- Low-cost 12 V and 48 V batteries for mild hybrids
- Battery systems for hybrid vehicles with high cyclic lifetime, high charging and discharging capability
- Battery systems for purely electrical applications with a focus on energy density and maximum safety at the same time
- Geometric potential of highly integrated cell-to-pack design concepts

**Florian Pampel, M. Sc.**, Research Associate, Battery System, Lehrstuhl für Thermodynamik mobiler Energiewandlungssysteme/Fakultät für Maschinenwesen, RWTH Aachen University, Co-authors: Dr.-Ing. Michael Stapelbroek, Dipl.-Ing. Igor Hazanavicius, both of FEV Consulting GmbH, Aachen

**Wireless Services in Next Generation E/E Architectures**

- New E/E architecture concepts need also to take connectivity into account
- In addition new and changed wireless services need to be considered
- A top-level E/E architecture with wireless will be proposed

**Dipl.-Ing. (FH) Thomas Zipper**, Head of Center E/E Architecture and Connectivity, Software and Functions – E/E Architecture, AVL Software and Functions GmbH, Regensburg, Co-Autor: Dipl.-Ing. Karl-Heinz Putz, AVL List GmbH, Graz, Austria

**Comprehensive Test Strategy for AI Based Systems: From AI Test Principles to Test Optimization**

- Artificial intelligence (AI) opens up a wide range of possibilities for the automotive industry
- Testing of AI based systems needs to reflect the specific characteristics of AI
- Evidence levels for AI based testing are proposed
- A concept of a comprehensive AI test strategy is proposed to improve AI testing

**Dr. Ulrich Bodenhausen**, Manager Consulting, Cybersecurity and AI, Vector Consulting Services GmbH, Stuttgart

**Continued protection for commercial vehicles and connected services**

- UN R155 and UN R156 making cybersecurity inevitable for OEMs
- Requirements to meet these regulations
- Solution for continuous protection of vehicles fleets through its operating life

**Juha Hytönen, M. Sc.**, Director Embedded Security, Connected Transport and **Carla Treviño, M. Sc.**, Solution Architect, Connected Transport, both of Irdeto B.V., Hoofddorp, The Netherlands

**The transfer of tech & the tech of transfer – learnings from adapting automotive sensors to the off-highway domain**

- Adapting automotive technology such as sensors, electronic control units, network protocols, promises to leverage scales of economies also for small volume off-highway applications
- Chances, specific limits and sometimes unexpected challenges
- Reflection on the last ten years of striking a balance in this field

**Dr. rer. nat. Alexander Flaig**, Senior Vice President Engineering Mobile Hydraulics, Co-author: Matthias Dorsch, both of Bosch Rexroth AG, Elchingen/Ulm

**10:30 Coffee break with visit to the exhibition**

**Sensors for Automation and Autonomy**

**Moderation: Dr.-Ing. Klaus Harms**, Bosch Management Support GmbH

**Safety and Security**

**Moderation: Dr. Joachim Schlosser**, Elektrobot Automotive GmbH

**Sensors and Silicon**

**Moderation: Dr. Rainer Holve**, Elektrobot Consulting

**Charging Communication & Infrastructure**

**Moderation: Peter Ziegler**, Daimler Truck AG

**Automation**

**Moderation: Dipl.-Ing. Roman Hofmann**, Liebherr-Elektronik GmbH

**11:00 Robust control strategies – Dealing with parameter uncertainties for traction drive systems and DC/DC-converters in automotive HV applications**

- Challenges in system identification of non-linear systems
- Development of control concepts
- Consideration of robustness without too much conservatism in dynamics

**Michael Thierer, M. Eng., M. Sc.**, Development Engineer Embedded Software/Controls, Cooperate Advanced Engineering Mechatronics, Co-author: Dipl.-Ing. Markus Cramme, both of MAHLE International GmbH, Stuttgart

**In-Vehicle and End-to-End Architecture**

- Single-instance IDS maintenance for a lower total cost of ownership
- Easy integration with support for hypervisor environments, leveraging compute capabilities in vehicle HPC (less hardware and fewer chips)
- Processing both CAN and Ethernet traffic in a single instance
- Facilitating compliance with new standards and regulations, such as UNR 155 and Chinese GB/T

**Dr. Haim Zlatokrilov**, Director Product, Argus Cyber Security, Tel Aviv, Israel

**Computational enhancement is key to cost effective 4D imaging radar solutions for large scale deployment**

- What is 4D imaging radar and what are the challenges associated with 4D imaging radar design?
- Why is computational enhancement essential?
- Which enhancements can be achieved with advanced software and signal processing algorithms and what are the benefits?

**Huanyu Gu, MBA**, Director Marketing & Business Development, Product Line ADAS, NXP Semiconductors Germany GmbH, Hamburg

**Charging communication for commercial vehicles – as simple as for passenger cars?**

- Essential aspects and their consideration in the charging standards
- Enabling high charging power with the Megawatt Charging System (MCS)
- The second generation of the ISO 15118 standard (ISO 15118-20) and its relevance for commercial vehicles

**Dipl.-Ing. (FH) Jan Großmann**, E-Mobility Test Solution Manager, Tools for Networks and Distributed Systems, Vector Informatik GmbH, Stuttgart

**Equipment Setup and Work Planning – a precondition for highly automated operations**

- Autonomous Operations require full definition of work missions
- Machine settings require adjustment depending on mission type
- Automatic assignment of work tasks to machine & implement combinations

**Dr.-Ing. Georg Kormann**, Engineering Manager, Technology Integration and Advanced Engineering, Co-authors: Dipl.-Inf. Julian Krien, Torben Ahrholz, M. Sc., all of European Technology Innovation Center, John Deere GmbH & Co. KG, Kaiserslautern

**11:30 New STiGaN technology for ultra-fast switching automotive applications**

- Wide Band Gap Materials / GaN
- 12V/48V DCDC Converter
- LiDAR
- Fast switching automotive applications

**Dipl.-Ing. Manuel Gärtner**, Director Marketing and Application, EMEA Region, STMicroelectronics Application GmbH, Aschheim-Dornach, Co-author: Dipl.-Ing. Nadia Lecci, STMicroelectronics s.r.l., Catania, Italy

**In-Vehicle Network Security – MACsec, the game changer**

- Why MACsec is of such great value for Automotive and related industries
- Automotive MACsec as MACsec adaption for vehicles
- How MACsec is an essential part in coming E/E Architectures (e.g. Zonal)
- Why MACsec is the preferred Network Security solution for Software-based vehicles

**Dr. Lars Völker**, Technical Fellow, Technology, Co-author: Thomas Königseder, both of Technica Engineering GmbH, Munich

**SPAD detector IC with on-chip histogram for high robustness in automotive applications**

- 20k-Pixel-Single-Photon-Avalanche-Diode-Array in low cost CMOS-process
- Specialized high-bandwidth SRAM-memory for improved detection probability under high ambient light conditions
- Solid-State-Scanning

**Fabian Finkeldey, M. Sc.**, Product-Architect optical systems, Product segment optical, Elmos Semiconductor SE, Dortmund

**MCS Megawatt Charging – Chances & Risks**

- Requirements for heavy duty electric trucks
- Challenges at vehicle development
- Charging infrastructure challenges
- Benefits of MCS charging

**Bernd Hofmann**, Charging System Developer, HV Distribution & Charging, Co-authors: Dipl.-Ing. Marcel Hessel, Vinzenz Stauner, all of MAN Truck & Bus SE, Munich

**Challenges and solutions regarding safety assurance for systems with machine learning components**

- Safety assurance challenges regarding systems with ML components
- Overview on solution approaches
- Presentation of recent research on dealing with uncertainties of ML components

**Dr.-Ing. Daniel Schneider**, Department Head Safety Engineering, Fraunhofer-Institut für Experimentelles Software Engineering (IESE), Kaiserslautern

**12:00 The Influence of Eccentricity and Tolerance on NVH Performance of Permanent Magnetic Machine with Different Skew Patterns**

- NVH analysis
  - Synchronous permanent magnet machine
- Dr.-Ing. Irene Woyna**, Manager Application Engineering, Co-author: Dr. Wenkai Shang, both of Ansys Germany GmbH, Darmstadt

**Architectural Guidelines for AUTOSAR-based E/E Systems with Safety-related Availability Requirements**

- Fundamental requirements for software in fail-operational systems
  - Achieving fault tolerance on system level using redundant architectures
  - Software fault avoidance and its impact on common cause analysis
- Jan Toennemann, M. Sc.**, Solution Manager for Functional Safety, Embedded Systems, Co-author: Dipl.-Ing. Jonas Wolf, both of Vector Informatik GmbH, Stuttgart

**Setting a new standard for ultrasonic near-field perception**

- Introducing a new data interface between sensor and system
  - Overcoming current limitations in object detection
  - Enabling previously infeasible perception using AI-based signal processing
- Dipl.-Wirtsch.-Ing. (FH) Harald Barth**, Product Marketing Manager, ADAS, Valeo Schalter und Sensoren GmbH, Bietigheim-Bissingen

**Real-time Context-aware AI Cloud E-Mobility services to optimize commercial transportation ecosystem**

- High energy consumption variance of electric drivetrains increases complexity of eVehicle fleet operations, lowers EV utilization and increases cost per kilometer compared to diesel vehicles
  - Model-based AI enables high-fidelity Live Digital Twin that models the behavior of the vehicle and vehicle components in actual driving conditions
  - AI Cloud deployed Contextual Mobility Intelligence fabric can provide the predictive contextual optimization of eVehicle fleet operations
  - Case Study of eBus fleet operation where high eBus utilization reduced cost per kilometer below diesel
- Santosh Alexander**, Chief Executive Officer, WideSense, Berkeley, CA, USA

**Overview and outlook of artificial intelligence for the commercial vehicle industry**

- Basic principles of artificial intelligence and machine learning
  - Current trends in research and on the market
  - Insights into research at DFKI in the field of autonomous systems
  - Categorization and scenarios for the commercial vehicle industry
- Dr. Jason Raphael Rambach**, Senior Researcher, Deutsches Forschungszentrum für Künstliche Intelligenz gGmbH (DFKI), Kaiserslautern

**12:30 Lunch break with visit to the exhibition**

**Simulation for Automated Driving and Driver Assistance Systems**

**Moderation: Dipl.-Ing. Martin Schleicher**, Continental AG

**Cloud and Communication**

**Moderation: Dr. Rainer Holve**, Elektrobit Consulting

**Intelligent Sensors and Maps**

**Moderation: Dr.-Ing. Michael Winkler**, Hella Fahrzeugkomponenten GmbH

**Autonomous Driving & Active Safety**

**Moderation: Dr.-Ing. Falk Hecker**, Knorr-Bremse Systeme für Nutzfahrzeuge GmbH

**Autonomy**

**Moderation: Dipl.-Ing. Jürgen Hollstein**, formerly John Deere – Tractor Electronics Ag & Turf Division

**14:00 Credible Simulation – Do you trust your simulation models?**

- Holistic approach with standard, processes, methods and tools to ensure credibility of simulation results
  - Credible Simulation to ensure simulations can be applied for Virtualized Release by substituting tests with real prototypes
  - Operational validation with metrics under consideration of statistical effects and uncertainties
  - Credibility measures for driver assistance simulation environment with virtual ECUs (Software-in-the-Loop approach)
- Dr.-Ing. Michael Baumann**, Project Manager Credible Simulation, Engineering Application Vehicle, Co-author: Dr.-Ing Irina Kaiser, both of Bosch Engineering GmbH, Abstatt

**How SOAFEE accelerates the transition from Cloud-native to Car-native**

- Use of cloud-native techniques to manage software and hardware complexity
  - Enhancing cloud-native standards with concepts specific to the Automotive domain
  - Enabling amortizing investment costs in software across multiple products and generations
- Matthew Spencer, B. Sc.**, Technical Director, Automotive, ARM Limited, Cambridge, United Kingdom

**Automatic camera-based road defect detection with neural networks**

- Optimization for detection accuracy, with simultaneous high frame rate
  - Evaluate speed and accuracy of detections in different driving situations.
  - Investigation of the influence of different methods for better detections
- Kevin Talits, M. Sc.**, PhD Student, Electronics Lab, HELLA GmbH & Co. KGaA, Lippstadt

**Autonomous Driving @ MAN & TRATON**

- MAN's technological foundation for autonomous vehicles
  - The key challenges of autonomous technology
  - Highly integrated engineering and software development approach within the TRATON Group
- Dipl.-Ing. Ralf Weller**, Vice President Automation and **Dr. rer. nat. Stefanie Manzinger**, Development Engineer, both of MAN Truck & Bus SE, Munich

**Bringing together major stakeholders to shape the future of autonomous operation. Can this also be done for the off-highway industry?**

- Autonomous working systems have to fulfill the expectation to work efficiently while minimizing costs
  - Components need to be designed robustly to withstand harsh conditions to make these developments also usable for the off-highway industry
  - Concepts out of automotive field are nowadays transferring also to the off-highway market
  - AOC a cross-market initiative focusing on application-oriented solutions for mobile machines
- Dr. Stefan Poledna**, Member of the Executive Board and CTO, TTTech Auto, Vienna, Austria and **Leandro Antonia Zaza**, Senior Technical Sales Manager, Technical Sales & Services, TTControl S.r.l., Brixen, Italy



14:30 **Mastering Data Replay and HIL for ADAS and AD together**

- Complex new interfaces like for cameras with bi-directional communication between the ECU and the sensor
- Tight control requirements over timing and data synchronization to feed the system with external datasets
- As changes are made to the ECU's software, the outputs and communication to and from the ECU may change

**Dipl.-Ing. Vitali Anselm**, Principal Business Development Manager – ADAS/AD, Co-author: Ilva Kotori, M. Sc., both of NI (National Instruments), Munich

**Real Life performance of IEEE 1722 Control Format (ACF) in future oriented networking architectures**

- Legacy networks transitioning to ethernet-based architectures
- Efficient methods for signal exchange between automotive devices
- Evaluation of an existing approach for signal transfer using proven technologies
- Benchmark in real life use case scenario

**Pablo Granados, M. Sc.**, Chief Marketing Officer, CETITEC GmbH, Pforzheim, Co-author: Joe Nguyen, CETITEC USA Inc., Dublin, OH, USA

**NDS – The Development and Use of a Worldwide Standard for Map Data**

- History of NDS – How the first format generation was designed and is deployed in many cars worldwide
- NDS.Live – Evaluation from an embedded map to a distributed map as a service
- NDS.Live Architecture – key concepts for a scalable solution for connected cars
- OpenDRIVE and NDS – how car manufacturers use real-world maps in simulation

**Dipl.-Inform. Fabian Klebert**, Technical Lead, Navigation Data Standard e.V., Gröbenzell

**L2 automated driving – next step for advanced driver assistance systems**

- Introduction of ‚Active Drive Assist‘ of Mercedes-Benz Actros, Freightliner Cascadia and Fuso SuperGreat
- System setup and limits of today's series sensors
- Experience of first 3 years ‚Active Drive Assist‘ in market
- Outlook into possible next steps and differentiation to SAE Level 4/5

**Dipl.-Wirtsch.-Ing. (FH) Christoph Tresp**, Director Advanced Driver Assistance Systems, Product Engineering Software & Electronics, Co-author: Sina Mustapha, both of Daimler Truck AG, Wörth

**The autonomous tractor – Foundational for autonomous production systems in agriculture**

- Basics of autonomous driving
- Requirements for automation in agriculture
- Concept for implementation of a fully autonomous production system

**Prof. Peter Pickel**, Deputy Director, Manager External Relations, European Technology Innovation Center, John Deere GmbH & Co. KG, Kaiserslautern

15:00 **Ground Truth a core enabler for data driven ADAS/AD development and validation**

- Statistical evaluation of real world recordings against an independent reference sensor system
- Integrated and automated data toolchain from data acquisition to statistical evaluation

**Dr.-Ing. Armin Engstle**, Main Department Manager, ADAS/AD Sensortesting, AVL Software and Functions GmbH, Roding

**Streaming Map Data efficiently from Cloud to ECUs**

- Using standards like NDS.Live and ADASIS for providing data from the Cloud to the ECUs
- Leveraging connectivity information to create tailor-made streaming packages
- Finding optimal trade-off between consumed data bandwidth and reliably working ECUs
- Cost Efficient Implementation of ISA and other ADAS functionalities

**Dr. Martin Pfeifle**, CTO, NNG Software GmbH, Stuttgart, Co-authors: Heikki Laime, NNG LLC, USA, György Blahut, NNG Kft, Hungary

**Reliable and safe maps for automated driving**

- Use cases for reliable and safe maps in automated driving
- Challenges in map production, transmission, and processing of map data
- Recommendations for action
- Standardization within the scope of the ISO TS 5083

**Dipl.-Ing. Steffen Kuhn**, Head of Consulting, Elektrobot Automotive GmbH, Erlangen

**Centralized Architecture in Commercial Vehicles and its impact on Software defined Architecture**

- Centralized architectures with central computing nodes
- Variants in model drives require flexible functional partitioning
- New SW Architectures, Processes, Methods and Tools are required
- SW defined Vehicles require interconnection of EE-Architecture, Framework Development and Function Development

**Dr. Mouham Tanimou**, Referent SW Defined Architecture, Commercial Vehicles and Off Road and **Dipl.-Ing. Tobias Stumpf**, Referent E/E-Architekt, Commercial Vehicles and Off Road, both of Robert Bosch GmbH, Stuttgart

**Autonomy by AgXeed**

- Development of an autonomous ecosystem
- Integration of implements for autonomous tasks
- Safety & Security

**Lars Schmitz, M. Sc.**, CTO, Engineering, Co-author: Joris Hiddema, both of AgXeed B.V., AL, Oirlo, The Netherlands

15:35 Final discussion and summary by the chairmen in the Auditorium (Basement)

15:45 End of the Congress

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