EUROPE ELIV

18th International Congress and Exhibition

October 18 – 19, 2017, Bonn

Dipl.-Ing. Uwe Michael,
Director Electrics/Electronics, Dr. Ing. h.c. F. Porsche AG, Weissach

Günther H. Oettinger,
European Commissioner for Budget & Human Resources, European Commission, Brussels, Belgium

Sanjay Brahmawar,
General Manager, IBM Watson Internet of Things, Munich

Dipl.-Ing. (FH) Helmut Matschi,
Member of the Board, Interiors Division, Continental AG, Regensburg

Dipl.-Inf. Elmar Frickenstein,
Senior Vice-President Fully Automated Driving, Driver Assistance, BMW AG, Munich

Dr.-Ing. Dirk Didascalou,
Vice-President, IoT, Amazon Web Service, Seattle, USA

#eliv

www.eliv-congress.com

Top Topics:

Highly Automated Driving
- Intelligence: data-based and artificial
- Enablers: sensor systems to environment model
- Validation: both virtual and real

Smart & Connected Vehicles
- From vehicle to back-end
- The framework: software

E-Mobility 2025
- Voltage: 48 – 800 V
- Charging: high-power and infrastructure

Offboard Ecosystems
- Big data in the automotive sector

Vehicle Wiring Systems 2025
- Orientation: by zones
- Mastery of complexity: development systems

End-to-End E/E Architecture
- Architecture: service oriented
- Key success factor: open and reusable

Security
- Duty regarding points of weakness
- Updating: over-the-air

Lighting Technology
- Matrix: intelligence in illumination

Methods + Testing
- Function integration virtual
- Test coverage with self-learning systems

UX
- From cognitive transfer to augmented reality
- Human-machine interface: user-centered

Including up-to-date contributions from

Audi Electronics Venture GmbH · AUTOSAR · BOSCH · CHARIN · Continental · DAF · HELLA · iav · Infineon · NVIDIA · Opel · PORSCHE · QUALCOMM · TATA ELXSI · Volkswagen · ZF

VDI Wissensforum

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VDI

The most important **branch meeting** for **experts in electronics**

ELIV – Program Overview

1st congress day
Wednesday, 18 October 2017

07:45 Registration

08:45 Opening of the Conference
Dipl.-Ing. Uwe Michael, Vice-President Electrics/Electronics, Dr. Ing. h.c. F. Porsche AG, Weissach, Chairman of the Program Committee

Plenary Lectures – New York (1st level)
Moderation: **Dipl.-Ing. Uwe Michael,** Porsche, Weissach

08:55 Major trends in electronics in the vehicle: Seamless electronics for automotive services
Dipl.-Ing. Uwe Michael, Dr. Ing. h.c. F. Porsche AG, Weissach

09:25 The transformation of the automotive industry – Autonomous Driving, new business models and scrum masters
Dipl.-Inf. Elmar Frickenstein, Senior Vice-President Fully Automated Driving, Driver Assistance, BMW AG, Munich

09:55 Winning in the Cognitive Era
Sanjay Brahmawar, General Manager, IBM Watson Internet of Things, Munich

10:25 Coffee break, exhibition and Start-Up Area visit (Genf room, 1st level)

11:00 Parallel Sessions

Session 1: New York (EG)	Session 2: Nairobi (EG)	Session 3: Wien (EG)	Session 4: Bangkok (UG)
Highly Automated Driving Moderation: **Dipl.-Inf. Elmar Frickenstein,** BMW, Munich	**Smart & Connected Vehicles** Moderation: **Dr.-Ing. Hans Welfers,** former MAN, Munich	**Offboard Ecosystems** Moderation: **Dipl.-Ing. Harald Deiss,** ZF Friedrichshafen, Auerbach	**Vehicle Wiring Systems 2025** Moderation: **Dipl.-Ing. Kai Barbehön,** BMW, Munich

12:30 Lunch, visit to the exhibition and Start-ups Area (Genf room, 1st level)

14:00 Parallel Sessions

Highly Automated Driving Moderation: **Dr. Dieter Rödder,** Robert Bosch, Stuttgart	**Smart & Connected Vehicles** Moderation: **Dipl.-Ing. Christof Kellerwessel,** Ford-Werke, Cologne	**Off-board Ecosystems** Moderation: **Dipl.-Ing. (BA) Frank Cornelius,** Daimler, Stuttgart	**End-to-End E/E Architecture** Moderation: **Dr. Thomas M. Müller,** AUDI, Ingolstadt

15:30 Coffee break, visit exhibition and Start-up Area visit (Genf room, 1st level)

16:15 Parallel Sessions

Testing Highly Automated Driving Moderation: **Bruno Praunsmändel,** Opel, Rüsselsheim	**Smart & Connected Vehicles** Moderation: **Dipl.-Ing. (FH) Helmut Matschi,** Continental, Regensburg	**Lighting Technology** Moderation: **Dr. Wolfgang Huhn,** AUDI, Ingolstadt	**Security** Moderation: **Dipl.-Ing. Ralf Milke,** Volkswagen, Wolfsburg

18:15 End of the first day of the congress

19:00 Night of Electronics at the former Bundestag
The VDI invites all participants, speakers, sponsors and exhibitors to join the "Night of Electronics" at the former Bundestag. This evening reception is the perfect opportunity to network and continue the discussions of the first congress day in a relaxed atmosphere. Meet your peers and business partners and enjoy a varied entertainment program plus live music.

Special exhibitions: "Highly Automated Driving" + "Charging"

Register at: www.eliv-congress.com

2nd congress day
Thursday, 19 October 2017

08:30 Parallel Sessions

Highly Automated Driving
Moderation: **Andreas Hackl,** MAN, Munich

E-Mobility 2025
Moderation: **Dr. Christian Kunstmann,** Opel, Rüsselsheim

Methods + Testing
Moderation: **Dr. Andreas Titze,,** Volkswagen, Wolfsburg

End-to-End E/E Architectures
Moderation: **Karl Barker,** Jaguar Land Rover, Gaydon, UK

10:00 Coffee break, exhibition and Start-up Area visit (Genf room, 1st level)

10:45 Plenary Lecture – New York
Günther H. Oettinger, European Commissioner for Budget & Human Resources, European Commission, Brussels, Belgium

11:20 Parallel Sessions

Highly Automated Driving
Moderation: **Dipl.-Ing. Stefan Teuchert,** MAN, Munich

E-Mobility 2025
Moderation: **Dr. Peter Redlich,** Ford-Werke, Cologne

Methods + Testing
Moderation: **Dr.-Ing. Klaus Büttner,** BMW, Munich

UX
Moderation: **Dr. Burkhard Milke,** Opel, Rüsselsheim

13:20 Lunch, Coffee break, exhibition and Start-up Area visit (Genf room, 1st level)

Plenary Lectures – New York (1st level)
Moderation: **Dipl.-Ing. (FH) Helmut Matschi,** Continental, Regensburg

14:30 The internet of things (IoT): a true disruption or yet another buzzword?
Dr.-Ing. Dirk Didascalou, Vice-President, IoT, Amazon Web Service, Seattle, USA

15:00 Megatrends in the electronics used in vehicles: conclusion and discussion
Dipl.-Ing. (FH) Helmut Matschi, Member of the Board, Division Interior, Continental AG, Regensburg

15:40 Award ceremony "Auto Electronic Excellence Award 2017", best start-up and closing of the congress

15:45 End of the second congress day

PROVEN

EUROPE ELIV

NEW

The new encounters the well-established – ELIV Bonn reaches a new level

What's new:
- More space for attendees AND exhibitors
- Extended topic range, such as off-board ecosystems, security, highly automated driving, 5G and more
- Start-Ups Area
- Vehicle exhibition
- Evening event held at the former Bundestag (German parliament)

What stays:
- Largest network gathering of automotive electronics engineers with more than 1600 international participants
- Meet with more than 120 specialist exhibitors
- Technical topics covered in depth in over 70 plenary lectures and expert presentations
- The most important event for electrics, electronics and system integration in vehicles
- ELIV sets trends and creates the base for important decisions

1st congress day

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Dipl.-Ing. Uwe Michael, Dr. Ing. h.c. F. Porsche AG, Weissach

09:25 The transformation of the automotive industry – Autonomous Driving, new business models and scrum masters
- International collaboration as key success factor on the way to Autonomous Driving
- Disruptive changes in working methods and structure for a new way of co-operation and new business models

Dipl.-Inf. Elmar Frickenstein, Senior Vice-President Fully Automated Driving, Driver Assistance, BMW AG, Munich

09:55 Winning in the Cognitive Era
- Watson
- Cognitive
- IoT

Sanjay Brahmawar, General Manager, IBM Watson Internet of Things, München

10:25 Coffee break, exhibition and Start-Up Area visit (Genf room, 1st level)

Highly Automated Driving

Moderation: **Dipl.-Inf. Elmar Frickenstein,** BMW, Munich

11:00

BMW 2021: the road towards Autonomous Driving

- Strategy and challenges in automated driving
- Planning automated driving BMW 2021
- Technology of highly (L3) and fully (L4) Automated Driving BMW
- Collaboration of the BMW, Intel and Mobileye incl. Autonomous Driving platform

Dr.-Ing. Klaus Büttner, Vice-President Projects Autonomous Driving, BMW Group AG, Garching

11:30

Making driving intuitive again: The most common use cases for Autonomous Driving

- Intel's research findings on the most common use cases for autonomous driving
- Discuss Intel's HMI research and how it can enhance the industry's product plans
- Industry contribution on making car-human interface intuitive
- Too much? Too little? How will humans and autonomous cars learn to trust one another

Kathy Winter, BS, MBA, Vice-President and General Manager, Automated Driving Solutions Division, Intel Corporation, Santa Clara, USA

12:00

Steps towards Highly Automated Driving

- "Building blocks" necessary for realizing HAD features
- Test results for platooning and auto-docking
- Lateral and longitudinal control concept
- Sensor fusion

Dr. ir. Rudolf Huisman, Senior Control Engineer, Vehicle Control,
Co-Authors: Ir. PD Eng. Thierry Kabos, Ir. Menno Beenakkers, all of DAF Trucks NV, Eindhoven, Netherlands

12:30 Lunch, visit to the exhibition and Start-up Area (Genf room, 1st level)

Smart & Connected Vehicles

Moderation: **Dr.-Ing. Hans Welfers,** former MAN, Munich

IT back-ends for Automated Driving and collaborative Driver Assistance

- IT back-end for Automated Driving
- Safety-relevant IT back-end and IT service
- Secure car-to-infrastructure communication
- Qualification of safety-relevant IT service

Dipl.-Ing. Uwe Beher, Senior Consultant, Innovation Center Automotive,
Co-Author: Thomas Weyrath, both of ESG Elektroniksystem- und Logistik-GmbH, Fürstenfeldbruck

Accelerating 5G for the Autonomous Future

- Creation and evolution of technologies to meet future mobility needs, including C-V2X, 5G and V2V
- 5G will redefine a wide range of industries and will create more than $2.4 trillion across the automotive sector by 2035
- V2X is a critical component for safety-conscious Autonomous Driving
- C-V2X offers new business models and economic benefits by leveraging ubiquitous cellular networks and mobile ecosystem support

Frank McCabe, VP Engineering, Product Management, Qualcomm Technologies, Inc., San Diego, USA

Connectivity: THE enabler for efficiency improvements in commercial vehicles

- Optimization of the key financial levers of fleets
- Reduction of fuel consumption by tracking and ranking vehicle and driver performance
- Sensor information for predictive tire maintenance
- The potential of OTA updates

Dr. Michael Ruf, Executive Vice President Commercial Vehicles & Aftermarket, Continental Automotive GmbH, Villingen

Offboard Ecosystems

Moderation: **Dipl.-Ing. Harald Deiss,** ZF Friedrichshafen, Auerbach

Access to vehicle data

Andreas Reich, Head of Electronics Predevelopment, AUDI AG, Ingolstadt, Dr. Nicolai A. Krämer, Elektronics, General Manager Cyber Security und Data Sharing Services, Connected Car, BMW AG, Munich, Dipl.-Ing. Ralf Lenninger, Head of Intelligent Transportation Systems, Continental, Regensburg

Car eWallet: no Autonomous Vehicle without autonomous transactions

- Driver convenience increased via automatized payments for all money streams around the vehicle
- Safe and anonymous data transfer based on block-chain technology
- Various use cases and service based on platform approach: parking, charging and tolls among others
- Varying levels of vehicle integration possible: retrofitting as an additional option

Julian Fieres, B.A., M.Sc., Head of Strategy, Business Development, M&A, ZF Friedrichshafen AG, Schweinfurt, and **Dr.-Ing. Alexander Graf,** Founder IoT-Lab, ZF Friedrichshafen AG, Friedrichshafen

Deep end-to-end learning in automobiles

- End-to-end deep learning for artificial intelligence in automobiles
- Automotive semantic segmentation using an end-to-end set-up
- Functional analysis of deep visual models
- Limits of deep architectures in automobiles

Dr., Dipl.-Inf. (FH) Patrick Ott, Head of Data Engineering, Co-Author: Dipl.-Ing. (BA) Gregor Matenaer, both of CMORE Automotive GmbH, Lindau

Vehicle Wiring Systems 2025

Moderation: **Dipl.-Ing. Kai Barbehön,** BMW, Munich

VOBES NG: the new harness development System of the Volkswagen Group

- Motivation: improved data management, integration in the IT world
- Focus on data and the data model
- Second step: Development of the new toolchain

Dr.-Ing. Ulrich Siebel, Team Leader Wiring Harness Development,
Co-Authors: Dr.-Ing. Ralf Gemmerich, Dipl.-Ing. D. Peters, all of Volkswagen AG, Wolfsburg

Zone-oriented E/E Architectures?

- Driver and challenges for (r)evolution of tomorrows E/E architecture
- Impact on the communication and energy supply system by new architecture approaches
- Evaluation method and optimisation of multi goals of future E/E architectures

Andreas Hörtling, M.Sc., Productmanagement E/E Architecture,
Co-Authors: Christian Bohne, Konrad Hofmann, Dr. Thorsten Huck, Dr. Andreas Lock, all of Robert Bosch GmbH, Abstatt, Dr. Oliver Koller, Robert Bosch GmbH, Weilimdorf

48V in series production

- Drivers for 48V energy networks in the vehicle
- Current variants of 48V energy networks and implemented customer functions
- Strategic outlook: requirements and challenges for second-generation 48V energy networks

Markus Gigler, M.Sc., Property Developer, Energy Management Development,, AUDI AG, Ingolstadt

Continued 1st congress day

Highly Automated Driving

Moderation: **Dr. Dieter Rödder,** Robert Bosch, Stuttgart

14:00 Highly Automated Driving (HAD) and Parking (HAP): trends and challenges

- Level 3 functions likely to be on the road within this decade
- System performance wins over component performance
- New approach to validation of HAD and HAP systems

Dr.-Ing. Stefan Waschul, Senior Vice-President, Chassis Systems Control,
Co-Authors: Dr. Burkhard Iske, Dr. Christian Raksch, Thomas Führer, all of Robert Bosch GmbH, Leonberg

14:30 Artificial intelligence for cars: applications, technologies and challenges

- Novel vehicle features enabled by AI
- Requirements of machine learning with respect to embedded platforms
- Software architectures for collective intelligence

Dipl.-Ing. Florian Netter, Project Lead Software Technology, Software Development,
Co-Author: Dipl.-Ing. Felix Friedmann, both of Audi Electronics Venture GmbH, Gaimersheim

15:00 Teaching a car to drive

- Teaching a car to drive by observation of human drivers
- Learned lane-keeping, lane changes and turns
- Tools for visualizing internal information processing
- End-to-end platform for self-driving cars

Dr. Urs Müller, Chief Architect – Autonomous Driving, Computer Vision,
Co-Authors: Lawrence D. Jackel, Joachim Langenwalter, all of NVIDIA Corporation, Holmdel, USA

Smart & Connected Vehicles

Moderation: **Dipl.-Ing. Christof Kellerwessel,** Ford-Werke, Cologne

5G Automotive Association helping to pioneer digital transformation in the automotive industry

- 5G – network of the future – communications for the automotive industry?!
- Automotive requirements for 5G
- The 5G Automotive Association links telecoms and the automotive industry
- Car-to-car communication: cellular V2X as a first step towards 5G

Dipl.-Inf. (FH) Christoph Voigt, Head of R&D Connectivity, Smart Antennas & Car2Car Technologies, Chairman of the Board 5GAA,
Co-Author: Dipl.-Ing. Jörg Plechinger, both of Audi AG, Ingolstadt

Component-based software framework for data preprocessing within Connected Car architectures

- Classification of algorithms
- Components and interfaces
- Reusability in conceptual confirmation and productive systems
- Basic research for self-adaptive systems

Dipl.-Ing. Falk Salzmann, Ph. D. Student, Connected Car, Co-Authors: Cand. Ing. Benjamin Zerche, both of Dr. Ing. h.c. F. Porsche AG, Weissach, Prof. Dr.-Ing. Bernard Bäker, Technical University, Dresden

Sense of touch for vehicles: smart sensors for vibration analysis

- "Feeling" car body/components make new vehicle applications possible
- Sensor platform for monitoring structure-borne sound
- Intelligent signal processing by sensors

Hauke Baumgärtel, M.Sc., Project Manager,
Co-Authors: Dipl.-Ing. Sergei Gontscharov, Dipl.-Ing. Julien Bungalski, all of Hella Fahrzeugkomponenten GmbH, Bremen

Off-board Ecosystems

Moderation: **Dipl.-Ing. (BA) Frank Cornelius,** Daimler, Stuttgart

Big Data in automotive mobility

- Autonomous vehicles will generate massive amounts of data
- 5G network as the data enabler for V2X
- Intel and ecosystem partnership to solve network problems

Kathy Winter, BS, MBA, Vice-President and General Manager, Automated Driving Solutions Division, Intel Corporation, Santa Clara, USA

The digital vehicle key: opportunities and challenges

- Digital vehicle keys enabling new business models
- Management of opposing requirements in development
- Use of a smartphone as vehicle key
- Establishment of a totally new use case in the complex ecosystem with the secure element issuer
- Standardization for use in different industries over different vehicle manufacturers

Dipl.-Inf. Johannes Wisbauer, Vehicle Function Owner, Function Development Body Electronics, AUDI AG, Ingolstadt

Creating the digital image for future Location-Based Services

- Crucial information from virtual foresighting beyond vehicle sensors
- Extensive context through a virtual cloud-based instance
- Control-point map and the importance of an open data ecosystem

Dipl.-Phys. Jochen Kirschbaum, Head of Collaborations, Roadmaps and Projects, BMW AG, Munich

End-to-End E/E Architecture

Moderation: **Dr. Thomas M. Müller,** AUDI, Ingolstadt

Seamless electronics for automotive services: enabler for future end-to-end electronic architectures

- Next generation of vehicle architectures efficiently supporting existing and future megatrends
- Concept based on a hierarchically structured architecture
- Modern infrastructure solutions, service orientation, function-based development and an end-to-end approach will be success factors in future architectures
- The vehicle as a part of an end-to-end eco- system

Dipl.-Ing. Rüdiger Roppel, Director Electrical/Electronic Engineering – Software, Dr. Ing. h. c. F. Porsche AG, Weissach
Co-Author: Dr. Rolf Zöller, Volkswagen AG, Wolfsburg

Service-oriented architecture for vehicles: new communication mechanism for central computing clusters with fail-operational requirements

- Central computing clusters and SOA in vehicles
- System architectural change: e.g. service migration and resulting fail-operational concepts
- Required rethinking in development, on the engineering level and in verification

Dipl.-Ing. Rudolf Grave, Senior Architect, Car Infrastructure, Co-Author: Alexander Much, both of Elektrobit Automotive GmbH, Erlangen

Modern approach to in-vehicle infotainment architecture

- RESTful micro service architecture for a clean "separation of concerns"
- Multi-client capability for a flexible distributed system
- Statelessness for a seamless user experience
- The navigation function as a flexibly usable service

Dipl.-Inform. Benjamin Groß, Development Engineer, Development Navigation, Volkswagen AG, Wolfsburg and **Dr.-Ing. Patrick Bartsch,** Manager in Software Architecture, Architecture MMI Systems, AUDI AG, Ingolstadt

15:30 **Coffee break, visit exhibition and Start-up Area visit (Genf room, 1st level)**

Testing Highly Automated Driving

Moderation: **Bruno Praunsmändel,** Opel, Rüsselsheim

16:15 **The Functional Engineering Platform (FEP): the development platfom of AUDI AG for Autonomous Driving**

- Software framework of AUDI AG for realizing a seamless development and testing platform
- Enabling simulation and testing in an early phase of the development of distributed functions
- Integration into the development of the virtual environment
- Bringing different domains together

Dipl.-Ing. Ralf Belke, Portfolio Manager, Development Software Development Tools and Methods, Audi Electronics Venture GmbH, Gaimersheim and **Dipl.-Inf. (FH) Gerhard Kiffe,** Head of Functional Engineering Platform Project, Development Processes/Methods R&D, AUDI AG, Ingolstadt

16:45 **Data-driven deployment of Autonomous Vehicles**

- Leverage of mobility data to identify top cities for autonomous vehicles
- Targeting high-value corridors for autonomous vehicle deployment within cities

Avery Ash, Autonomous Vehicle Market Strategist, Co-Authors: Bob Pishue, Benjamin Weiser, all of INRIX, Kirkland, USA

17:15 **Real-time capable sensor models for virtual test driving: classification and application in the development and validation of Automated Driving functions**

- Multi-level system for sensor models
- Advantages and possible applications of ideal, phenomenological and physical virtual sensors
- Efficient testing with sensor models of all three sensor classes

Martin Herrmann, M.Sc., Specialist ADAS and Autonomous Driving, Business Development, Co-Author: Dipl.-Inf. Dominik Dörr, both of IPG Automotive GmbH, Karlsruhe

Smart & Connected Vehicles

Moderation: **Dipl.-Ing. (FH) Helmut Matschi,** Continental, Regensburg

Environment sensor for everybody: serial development of the driving measurement station

- Data extraction and data uploading of environment sensor data from cars
- Data used and the process of data uploading
- Practical example: the front camera

Dr.-Ing. Stephan Max, Development Driver Assistance Systems Online,
Co-Authors: Roman Koch, Torsten Büschenfeld, all of Volkswagen AG, Wolfsburg

Smart Parking - IoT-based parking function

- Distributed smart functions
- System solution for automated parking
- Integration of vehicle systems into Internet of Things
- Determination of occupied status of on-street and off-street parking lots

Jan Obermüller, Technical Consultant, Business Area Vehicle Integrated Functions, IAV GmbH, Stollberg

Framework conditions for the implementation of back-end-based functions in the context of Connected Vehicles

- M2M protocol tests based on a test framework
- Derivation of limiting conditions for back-end-based vehicle functions
- Data rate vs. latency
- Applicability of cloud systems to the future implementation of back-end-based vehicle functions

Dipl.-Ing. Tim Häberlein, Scientific Assistant, Institute of Automobile Engineering, Chair of Vehicle Mechatronics, Co-Authors: Dipl.-Ing. Andreas Unger, both of TU Dresden, Dr.-Ing. Oliver Manicke, Dr. Ing. h.c. F. Porsche AG, Weissach

Lighting Technology

Moderation: **Dr. Wolfgang Huhn,** AUDI, Ingolstadt

Opel's Matrix Light: checkmate for the darkness

- Democratization of premium lighting technologies
- Problem-solving in a complex vehicle architecture
- Dynamic adaption of a static lighting system (in the example of the new Insignia)
- Future lighting technologies at Opel

Dipl.-Ing. Torsten Kanning, BOM Family Owner AFL ECU, Active Safety Components, and **Dipl.-Ing. Frank Langkabel,** Project Engineer, Body & Exterior – PE Exterior Lighting, both of Opel Automobile GmbH, Rüsselsheim

High definition headlamps: challenges for electronic system architectures

- Digital light
- Real-time calculation of light distributions for pixel light
- 3D light distribution and using artificial contrast for the driver
- Liquid crystal display (LCD) headlamp

Dr.-Ing. Jacek Roslak, Head of Predevelopment Lighting Electronics, Co-Author: Dr. Carsten Wilks, both of HELLA KGaA Hueck & Co., Lippstadt

Intelligent lighting: the growing impact of electronics and software in the field of automotive lighting

- Automotive lighting in the age of digitalization and connectivity
- Impact of multiple market trends on development (sensor fusion and connectivity/Car2x for predictive lighting functions)
- Impact of software/function and Continental's contribution

Dr. Maximilian Austerer, Head of Advanced Development Lighting Controls, Business Unit Body&Security, Continental Automotive GmbH, Vienna, Austria,
Co-Author: Dipl.-Wirtsch.-Ing. Jörg-Michael Zimmermann, Continental Automotive GmbH, Regensburg

Security

Moderation: **Dipl.-Ing. Ralf Milke,** Volkswagen, Wolfsburg

Intelligence-driven offensive defense: a new approach to cyber security

- Behind every cyber attack are humans
- Humans have behaviours which can be detected – before the attacks
- Cyber attacks do not start in the reconnaissance stage as is commonly assumed
- Blocking cyber attacks before they reach the organizational network is a possible goal for the automotive industry in the era of the autonomous car

Yuval Diskin, Chairman, CyMotive Technologies Ltd, Herzlia, Israel

(Cyber) security/Over-the-Air updates

- Reduction of warranty-related costs by reducing the number of software-related recalls
- Post-build functional upgrades and even new function downloads
- Trust of the end consumer in the ecosystem of Connected Vehicles
- Challenges of Over-the-Air operations and security

Dipl.-Ing. Stefan Römmele, Head of Security & Privacy Competence Center, Continental AG, Frankfurt am Main

"Pay or you stay": ransomware targeting cars

- Functioning, incidence, and success model of ransomware compared to classic IT systems
- Risk analysis of possible infection paths and security threats targeting private, public and commercial vehicles
- Effective protection against automotive ransomware on the technical and organizational levels

Dr.-Ing. Marko Wolf, Head of Consulting & Engineering, ESCRYPT – Embedded Security GmbH, Munich
Co-Author: Dr. Robert Lambert, ETAS Canada Inc., Ontario, Canada

Continued 1st congress day

17:45 **Virtual homologation of software-intensive safety systems: from ESP to Automated Driving**

- Simulation-aided type approval and homologation
- Homologation of software-intensive active systems, Automated Driving, Autonomous Driving
- Reduction of test efforts and costs
- Analogies to existing regulations, i.e. UN-ECE R13

Dr.-Ing. Houssem Abdellatif, Global Head Autonomous Driving & ADAS, TÜV SÜD Auto Service GmbH, Garching
Co-Author: Prof. Bernhard Schick, University of Applied Science, Kempten

A new world of mobility – but which direction does the customer take?

- Understand GenY/Z's attitudes towards mobility and different transportation options, such as car-sharing
- Understanding consumer needs in different mobility situations and understanding how different transportation concepts fulfil consumer needs, such as new engines, connectivity, etc.
- Evaluating current mobility trends and brand images of automotive brands

Dipl.-Volksw. Petra Hannemann, Account Director, and **Dipl.-Sozialwis. Bettina Saffer,** Account Director, both of Industry Automotive, GfK SE, Nuremberg

On the path towards intelligent headlights: concepts for high-resolution light sources

- Highly efficient, directly controlled LED arrays
- High luminance compared with standard LEDs
- Standard microcontroller operates as a display controller incorporated into the headlight system
- Use of cost-effective and automotive-compliant standard interfaces

Dipl.-Ing. Thomas Liebetrau, Lead Principal Engineer – Automotive Systems, Automotive Division – System Group, Infineon AG, Neubiberg and **Dipl.-Ing. Stefan Grötsch,** Principal Key Expert - Applications, Applications Engineering Automotive Visible LED, OSRAM Opto Semiconductors GmbH, Regensburg

Car hacking: navigating the risk landscape

- Shifting mindsets from compliance-focused to an integrated approach to cyber security
- Comprehensive interpretation of focus areas of automotive security
- Looking into the regulatory environment
- Management imperatives for the era of evolving threats

Prof. Tamir Bechor, CEO, CYMOTIVE GmbH, Wolfsburg and **Dr.-Ing. Rainer Kühne,** Head of Antenna Systems, Electronic Engineering - Antenna Systems, Volkswagen AG, Wolfsburg

18:15 **End of the first congress day**

19:00 **Night of Electronics at the former Bundestag**

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2nd congress day

Thursday, 19 October 2017

Highly Automated Driving
Moderation: **Andreas Hackl,** MAN, Munich

08:30 **Environment representation, localization and object classification for Autonomous Driving**

- Environment representation, e.g. techniques and applications of Occupancy Grid Mapping (OGM) and free space estimation in autonomous driving
- Self-localization of the vehicle
- Obstacle detection
- Micro-Doppler-based VRU detection and classification

Henrik Clasen, Technical Manager Safety Systems, Advanced Electronic Controls Europe, Delphi, Goteborg, Sweden
Co-Authors: Dr. Alexander Ioffe, Dr. Christian Nunn, both of Delphi Deutschland GmbH, Wuppertal

09:00 **Cross-industry cooperation for camera technology standardization**

- Introduction to and overview of camera technology
- Future camera architecture and concepts with a focus on standardization

Dr.-Ing. Frerk Fitzek, Head of Modules Camera Systems Driving, Night Vision System, Component Testing, BMW Group AG, Munich,
Co-Authors: Ulrich Seger, Robert Bosch GmbH, Leonberg, Dave Lewis, Texas Instruments Incorporated, Munich

E-Mobility 2025
Moderation: **Dr. Christian Kunstmann,** Opel, Rüsselsheim

The path to a global EV charging system: how to harmonize the customer interface

- Rolling out and establishing the Combined Charging System (CCS) as the global standard for charging battery-powered electric vehicles of all kinds
- Drawing up requirements for the evolution of charging-related standards and setting up a conformance verification system for use by manufacturers
- Promotion of the CCS standard worldwide
- Development of charging standards

Dipl.-Ing. (FH) Fabian Grill, Director Charging Systems, SC, Charging Interface Initiative e. V., Berlin

Challenges of a 48 V drive system with 20 kW continuous mechanical power

- Emissions and air pollution are leading to a growing demand for e-mobility
- Results from test drives: 20 kW mechanical power is sufficient for city driving with a compact vehicle
- 20 kW is possible with the new 48V boardnet. There are advantages in costs and effort
- For 20kW mechanical power in a 48 V boardnet, 600 A needs to be handled

Karl-Martin Fritsch, M.Sc., Development Engineer, Technical Project Manager, Corporate Advanced Engineering,
Co-Authors: Dipl.-Ing. Markus Cramme, Tobias Binder, M.Eng., all of MAHLE International GmbH, Stuttgart

Methods + Testing
Moderation: **Dr. Andreas Titze,** Volkswagen, Wolfsburg

Digital readiness: virtual function integration and safeguarding in Volkswagen's R&D simulation lab (SimLAB)

- Seeing integration of the entire E/E assemblage as an independent task for development
- An entire simulation platform for function integration and safeguarding
- Reduction of hardware implementation by combining simulative technologies and traditional safeguarding techniques
- Agile organization and its implementation in existing structures

Dr. Peter Oel, Head of System Testing, Product Quality Electrical and Electronic Development,
Co-Authors: Dipl.-Betriebsw. Benjamin Aschoff, Dipl.-Ing. (FH) Florian Pohl, all of Volkswagen AG, Wolfsburg

Software test methods in use at General Motors: seamless testing from C code to high-level feature requirements

- Hardware-in-the-loop tests to verify correct integration of software into the target controller
- Model-in-the-loop tests and in-vehicle tests to verify feature-level requirements
- Functional model unit tests to verify that the Simulink model fulfils low-level software requirements
- Equivalence tests verifying the similar behaviour of C code generated from the Simulink model and the Simulink model itself

Dipl.-Ing. (FH) Marc Giertzsch, Algorithm Design Engineer, Vehicle Software & Controls, Opel Automobile GmbH, Rüsselsheim

End-to-End E/E Architectures
Moderation: **Karl Barker,** Jaguar Land Rover, Gaydon, UK

AUTOSAR proves to be the automotive software platform for intelligent mobility

- Overview and achievements
- Challenges from new applications and technological drivers
- Adaptive platform for Autonomous and Connected Vehicles
- New collaboration model

Dr.-Ing. Thomas Scharnhorst, Spokesperson, AUTOSAR Entwicklungspartnerschaft, Munich
Co-Authors: Simon Fürst, BMW AG, Stefan Rathgeber, Continental Corporation, Lorenz Slansky, Daimler AG, Frank Kirschke-Biller, Ford Motor Company, Rick Flores, General Motors, Tony Jaux, PSA Peugeot Citroën, Thomas Rüping, Robert Bosch GmbH, Kenji Nishikawa, Toyota Motor Company, Dr. Carsten Krömke, Volkswagen AG

New integrated platform as a response to current requirements applicable to E/E architecture

Dr. Karsten Michels, Senior Vice-President, Interior System & Technology, Continental Automotive GmbH, Babenhausen

Continued 2nd congress day

09:30

Extending sensor range for highly Automated Driving: a new approach to environment modelling

- The local environment model
- The EB robinos software framework for automated driving
- Cloud-based aggregation of environment information
- Spread environment information

Dr. phil., Dipl.-Ling. Nicole Beringer, Program Manager Highly Automated Driving, Innovation Management, Elektrobit Automotive GmbH, Erlangen

High-power charging with the Combined Charging Interface

- A successful market launch of long-range BEVs requires improved charging technology
- Charging up to 400 A and 1000 V is required
- Charging equipment must be easy to use and operate
- The success factor in HPC is cooling the charging connector and cable

Dipl.-Ing. Matthias Kübel, Standardization and Concepts Charging Interface, Wiring Harness Systems and Components, Volkswagen AG, Wolfsburg

Accepting uncertainty: applying proven methods for quantifying test results and test coverage to ensure the safety compliance of self-learning systems

- Solving the problem of testing/validation for self-learning/non-deterministic systems
- Solving the effort problem by calculating quantitative results
- Optimizing TCO over the development cycle by shifting efforts between development domains

Rainer Straschill, ADAS/AD, Electronics and Electrification,
Co-Author: Tobias Schäfer, both of FEV Europe GmbH, Aachen

Architecture of a complex hardware-agnostic high-level function: implementing a state-of-the-art AC control system

- Characteristics of a system-independent and scalable climate-control SW architecture
- Managing function-oriented climate variants with the restriction of a single source code
- Efficient testing of variants
- Virtual verification as a necessary technology for future projects

Diplom-Inf. (FH) Werner Braunstorfer, CEO,
Co-Authors: Dipl.-Ing. (FH) Christian Maier, both of TKI Automotive GmbH, Gaimersheim, Dipl.-Ing. (FH) Erich Liepold, AUDI AG, Ingolstadt

10:00 Coffee break, exhibition and Start-up Area visit (Genf room, 1st level)

10:45 Plenary Lecture – New York
Günther H. Oettinger, European Commissioner for Budget & Human Resources, European Commission, Brussels, Belgium

Highly Automated Driving

Moderation: **Dipl.-Ing. Stefan Teuchert,** MAN, Munich

11:20

Proposal for the standardization of sensor interfaces with a fusion unit

- Complex sensor set-ups of AD functions need to be standardized
- Possible levels of standardization by means of an abstract sensor set-up
- Standardization of the logical interface between sensor and fusion unit as a first step
- Standardization initiative in VDA/ISO

Dr.-Ing. Thomas Schaller, Automated Driving and Driving Assistance, BMW AG, Munich
Co-Authors: Dr. Werner Uhler, Robert Bosch GmbH, Leonberg, Jörg Schrepfer, Valeo Schalter und Sensoren GmbH, Kronach

11:50

Sensor and functions interface in an Open Fusion Platform (OFP)

- Standardization of interfaces into an environmental fusion model
- Generic platform for automated driving functions
- Use case using radar, surround-view camera and V2X

Dr. rer. nat. Michael Schilling, Project Manager Automated Driving, Advanced Engineering Projects Automated Driving, HELLA KGaA Hueck & Co., Lippstadt

E-Mobility 2025

Moderation: **Dr. Peter Redlich,** Ford-Werke, Cologne

Porsche HPC Infrastructure: a new concept of a DC fast-charging infrastructure to cope with future challenges

- The necessity for high-power charging
- 800 V charging
- Infrastructural challenges
- Porsche's high-power charging solution

Dipl.-Ing. Michael Kiefer, Director High-Voltage-Systems, Dr. Ing. h.c. F. Porsche AG, Stuttgart, Co-Author: Volker Reber, Porsche Engineering Services GmbH, Bietigheim-Bissingen

SoC-swing-based optimization of automotive batteries using simulations

- Model-based design of high-voltage batteries for electric vehicles
- Location of SoC swing as a key design factor
- Global optimization of the battery configuration using a genetic algorithm

Felix Frank, M.Sc., PhD Student, System-Development, Co-Authors: Dr.-Ing. Jörg Wilhelm, both of Robert Bosch Battery Systems, Stuttgart-Feuerbach, Prof. Dr.-Ing. Dr. h.c. Dieter Schramm, University Duisburg-Essen

Methods + Testing

Moderation: **Dr.-Ing. Klaus Büttner,** BMW, Munich

Test automation: insights from practical application

- High agility is required in the dynamic field of e-mobility
- Agile MBD suite as an enabler for the rapid prototyping of e-drives
- Automated quality safeguarding via CI and test automation
- Result: design changes can be realized quickly and safely

Dipl.-Ing. Peter Ginal, Group Leader Drive Control Software Development, Valeo Siemens eAutomotive GmbH, Erlangen
Co-Author: Dr. Heiko Dörr, MES Model Engineering Solutions GmbH, Berlin

Interactive specification and validation of highly automated driving functions in a mixed-reality environment

- Proband study
- Pedestrian perspective in relation to highly automated driving
- Microsoft HoloLens

Dipl.-Ing. Benedikt Schonlau, Head of Department, Automated ITS,
Co-Authors: Bastian Hermann, Dr. rer. nat. Klaus Krumbiegel, all of IAV GmbH, Stollberg

UX

Moderation: **Dr. Burkhard Milke,** Opel, Rüsselsheim

The automotive UI in the change through digitalization

- Consumer electronics and digitalization are changing our lives: how much CE are in automotive UIs?
- The automotive UI is changing from a part of the interior to a leading element
- Premium in-between simplicity and functional growth
- Highly Automated Driving as new stakeholder for future automotive UIs

Dipl.-Ing. (FH) Michael Zeyn, Director Development UI/UX Concepts & Functions, AUDI AG, Ingolstadt

AR head-up display: system requirements and solutions regarding precise augmentation of information within the road scene

- Data fusion and synchronization
- Compensation of system latencies
- Prediction mechanisms based on vehicle sensors
- System architecture

Dr. rer. nat. Arne Jachens, Group Leader, Product Development Center Head-up Displays,
Co-Authors: Dr. Thorsten-Alexander Kern, Dr. Heinz Abel, all of Continental Automotive GmbH, Babenhausen

12:20 **Linux in safety-critical systems for future ADAS and semi-automated driving functionality**

- Early functional safety decomposition
- Linux versus RTOS Microkernel: efficiency versus predictability
- Hypervisor for OS separation
- Linux and QNX in network-oriented systems

Dipl.-Inf. Thorsten Wilmer, Software Architect, ADAS System Team,
Co-Author: Dr. Thomas Kopfstedt, both of Visteon Electronics Germany GmbH, Karlsruhe

Charging challenge in commercial vehicles

- Fast and high-power charging as a new challenge
- Thermal management as a new key enabler
- New solutions for efficient charging
- Implications for the battery

Dipl.-Ing. (FH) Gerald Teuschl, Senior Product Manager Powertrain Electrification, Co-Authors: Dipl.Ing. M. Deiml, Dipl.-Ing. Matthias Hütter, all of AVL List GmbH, Graz, Austria

Power-net-in-the-loop: closed-loop power-net testing with real-time simulation

- Frontloading of development tasks
- Transfer of road-to-rig methodology to power-net test bench
- Co-simulation of entire powertrain, power net, longitudinal dynamics and transversal dynamics
- Seamless transfer from model-in-the-loop to hardware-in-the-loop

Philip Griefnow, M.Sc., Research Associate, Mechatronic Systems for Combustion Engines,
Co-Authors: Serge Klein, M.Sc., Prof. Dr.-Ing. Jakob Andert, all of RWTH Aachen University

Cognitive driver take-over capability after piloted driving: method development and interaction with a side task

- Experimental development of a method for the detection of a further measurement variable for take-over capability
- Simulator studies with an additional secondary task
- Speech reaction as a measurement for cognitive take-over capability
- Adaption of human-machine interaction related to cognitive take-over capability

Dr. Ina Othersen, Project Manager, Driver Interaction,
Co-Authors: Dr. Ina Petermann-Stock, both of Volkswagen AG, Wolfsburg, Dr. Nadja Schömig, Würzburger Institut für Verkehrswissenschaften (WIVW GmbH), Veitshöchheim

12:50 **AADC-AUDI Autonomous Driving cars: an open platform for predevelopment and demonstration of Automatic Driving functions based on model cars**

- Students contest 'AUDI Autonomous Driving Cup'
- Model cars
- Options for using the AADC models as a development platform
- Example: 'swarm data function on-street parking'

Dr.-Ing. Lars Mesow, Project Leader, Development SW-Development Tools and Methods,
Co-Author: Dr. Florian Knabl, both of Audi Electronics Venture GmbH, Gaimersheim

Challenges in battery development: the best fit

- Battery design principles
- Properties of different battery designs
- Trade-off between energy density, charging performance, lifetime and cost
- Trends in battery design

Dipl.-Ing. Franz Nietfeld, Senior Manager Battery Integration, Research and Development, Battery Integration,
Co-Authors: Dr. Thomas Soczka Guth, Florian Hofbeck, all of Daimler AG, Sindelfingen

Powertrain system testing (PST): a new test element within a holistic test strategy for hybrid vehicle powertrains within the product development process

- Consistent wording in the field of automotive testing
- Methods for the validation of vehicle powertrains
- Integrative testing

Dipl.-Ing. Filiz Akkaya, Project Engineer, Powertrain Test Rig Facilities,
Co-Authors: Dr.-Ing. Wolfgang Klos, both of Dr. Ing. h.c. F. Porsche AG, Weissach, Prof. Dr.-Ing. Hans-Christian Reuss, Research Institute of Automotive Engineering and Vehicle Engines Stuttgart (FKFS)

User-centric HMI: consideration of the behavioral aspect of the driver

- HMI based on human factors
- Usability
- Methods of design and development, more effective and user-centric HMI
- Allowing the driver to interact with the vehicle as a buddy and not as an object

Atul Patil, Specialist, Automotive Infotainment, TATA ELXSI Ltd., Bangalore, India
Co-Author: Sameer Shinde, TATA ELXSI Ltd., Pune, India

13:20 **Lunch, Coffee break, exhibition and Start-up Area visit (Genf room, 1st level)**

Plenary Lectures – New York (1st level)

Moderation: Dipl.-Ing. (FH) Helmut Matschi, Continental, Regensburg

14:30 **The internet of things (IoT): a true disruption or yet another buzzword?**

- A value approach to the internet of things
- What if the speed of light is too slow? A seamless programming model for edge devices and the cloud
- How to make dumb things smart? Actions based on insights from device data
- The real driver of disruption: technology or culture?

Dr.-Ing. Dirk Didascalou, Vice President, IoT, Amazon Web Service, Seattle, USA

15:00 **Megatrends in the electronics used in vehicles: conclusion and discussion**
Dipl.-Ing. (FH) Helmut Matschi, Member of the Board, Division Interior, Continental AG, Regensburg

15:40 **Award ceremony "Auto Electronic Excellence Award 2017", best start-up and closing of the congress**

15:55 **End of the second congress day**

ELIV Workshop – Your "know-how" benefit

The seminar can be booked separately

Tuesday, 17 October 2017

International VDI Workshop

IT Security for Connected/Autonomous Cars

Workshop Chair:
Dipl.-Phys. Hartmut Kaiser and Dipl.-Inf. (FH) Harry Knechtel,
both secunet Security Networks AG, Munich, Germany

Date and venue:
October 17, 2017
Bonn, Germany

Time:
10:00 – 17:00

CONTENT

This workshop provides an overview on security for Connected/Autonomous Cars and allows participants to interactively exchange information with peers. We are going to discuss technical trends influencing automotive security, known and new security requirements and methodology to deduce them. Furthermore, automotive security best practices regarding security concepts and applied crytography are covered.
The main part of the workshop consists of breakout sessions in which important topics will be elaborated on followed by moderated discussions. Participants are invited to actively contribute during the breakouts. All breakouts are started by a short presentation, including comparisons with similar developments as occurred in other industries if available. At the end of each session participants present their results and discuss them with their peers and the workshop chairs.

Presentation

- Overview of Automotive Security including Cyber Threat Landscape, Methodology and best practice in
  - » automotive risk analysis,
  - » security requirements engineering and
  - » security concepts (e.g. embedded vehicle security, PKI, ...)
- Adaptation for Connected/Autonomous Car scenarios

Breakout Sessions – Planned topics include:

- Security requirements of selected Connected/Autonomous Cars use cases
- Security measures and defense-in-depth building blocks

Discussion and conclusion

- Main findings of the workshop day
- Outlook into the future of connected/autonomous cars security

Note:
The workshop will be held in English.

Start-up the future!

Visit our start-up area in **Genf** and learn about the latest innovations by young companies in the field of automotive electronics. Our **start-up chat** takes place there during the conference breaks.

Start-up chat – 10 min. to start (it) up

In our **start-up chat,** young companies get the opportunity to present themselves and their innovations in a short lecture. The lectures take place during the lunch break and afternoon coffee breaks.

You can hear these lectures among others.
"Challenges & opportunities of the connected car" by **Florian Hofer, autoaid GmbH**
"Viewing safer driving through perceptual processing" by **IRYStec Software inc.**
"How will V2X technology contribute to making Vision Zero a reality ?" by **Jens Kahrweg, Savari GmbH**
"HIL for Vehicle Electric Systems" by **Ravi Venugopal, Ph.D., OPAL-RT EUROPE**
"Seeing with sound – 3D ultrasound for autonomous vehicles" by **Tobias Bahnemann, Toposens GmbH**
"Human-centric mobility" by **Arshia Gratiot, Third Space Auto Ltd.**
"Cyber security in the automotive industry" by **Dipl.-Inform. Udo Steinberg, CyMotive Technologies GmbH**
"Trust, Integrity and Identity for Connected Devices" by **Matthias L. Jugel, ubirch GmbH**
"Motion prediction saves lives" by **Fedor Löhrig, preemoo**

The detailed programme for our start-up chats can be found on our ELIV event app, which will soon be available. Vote for the best start-up at the ELIV. "The Best Start-Up" award ceremony will take place at the end of the second conference day following the "Auto Electronic Excellence Award 2017".

Start-ups (as of September 2017):

- autoaid GmbH
- CyMotive Technologies GmbH
- GaN Systems Inc.
- IRYStec Software inc.
- OPAL-RT EUROPE
- preemoo
- Savari GmbH
- Third Space Auto Ltd
- Toposens GmbH
- ubirch GmbH

Start-up Area

2017 is the first time ELIV offers young companies the opportunity of presenting their latest developments and products in automotive electronics in the start-up area.

Start-ups are invited to seize their opportunity and interact directly with an exclusive, international circle of participants, consisting of decision-makers and specialists from vehicle manufacturers, suppliers and service providers as well as representatives from universities.

Interested in taking part?

To apply request the registration documents for the start-ups area. We are happy to provide assistance and further information:

Martina Slominski
Project Consultant Exhibitions & Sponsoring
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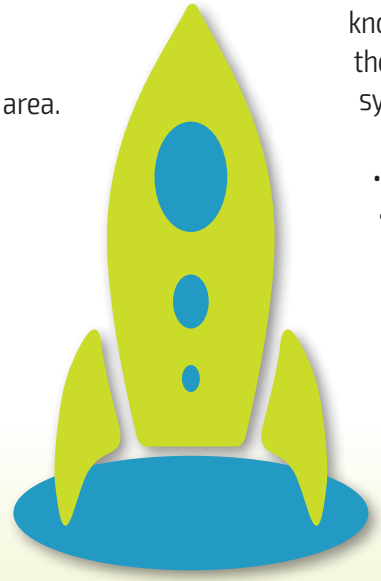
Email: slominski@vdi.de



Special exhibitions: “Highly Automated Driving” + “Charging”

Everyone‘s talking about highly automated driving but only a few know the detailed inside-outs. Make the most out of your attendance at ELIV and visit the technology exhibition on this hot topic. Here, with the aid of vehicles, measuring systems etc., OEMs and suppliers will clarify the major requirements for you:

- Highly accurate maps
- Sensor technology (radar, camera, lidar, etc.) and sensor fusion (IDC)
- Actuator systems (steering, brakes, ESP, and so on)
- Vehicle integration
- Human-machine interface or system understanding

On top of that there will be a special exhibition focusing on “Charging” at the forecourt.

– Subject to change –

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If you are interested, please contact:

Program Committee

ELIV offers a host of **networking opportunities,** a large exhibition and above all a very topical program of lectures for participants to discover the very latest developments, current new trends and routes to future solutions.

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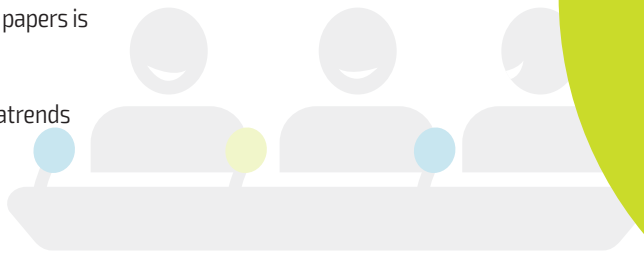


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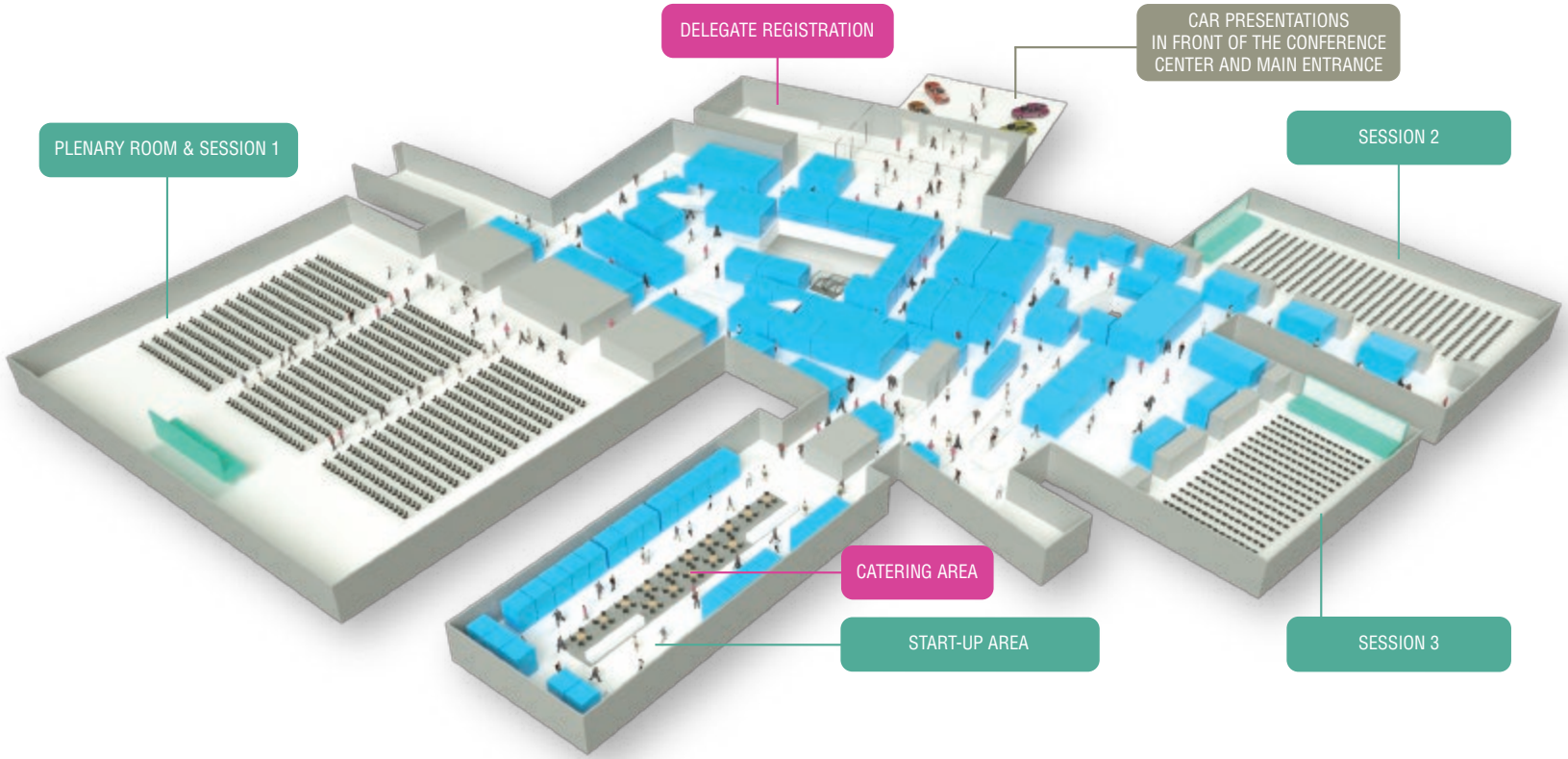

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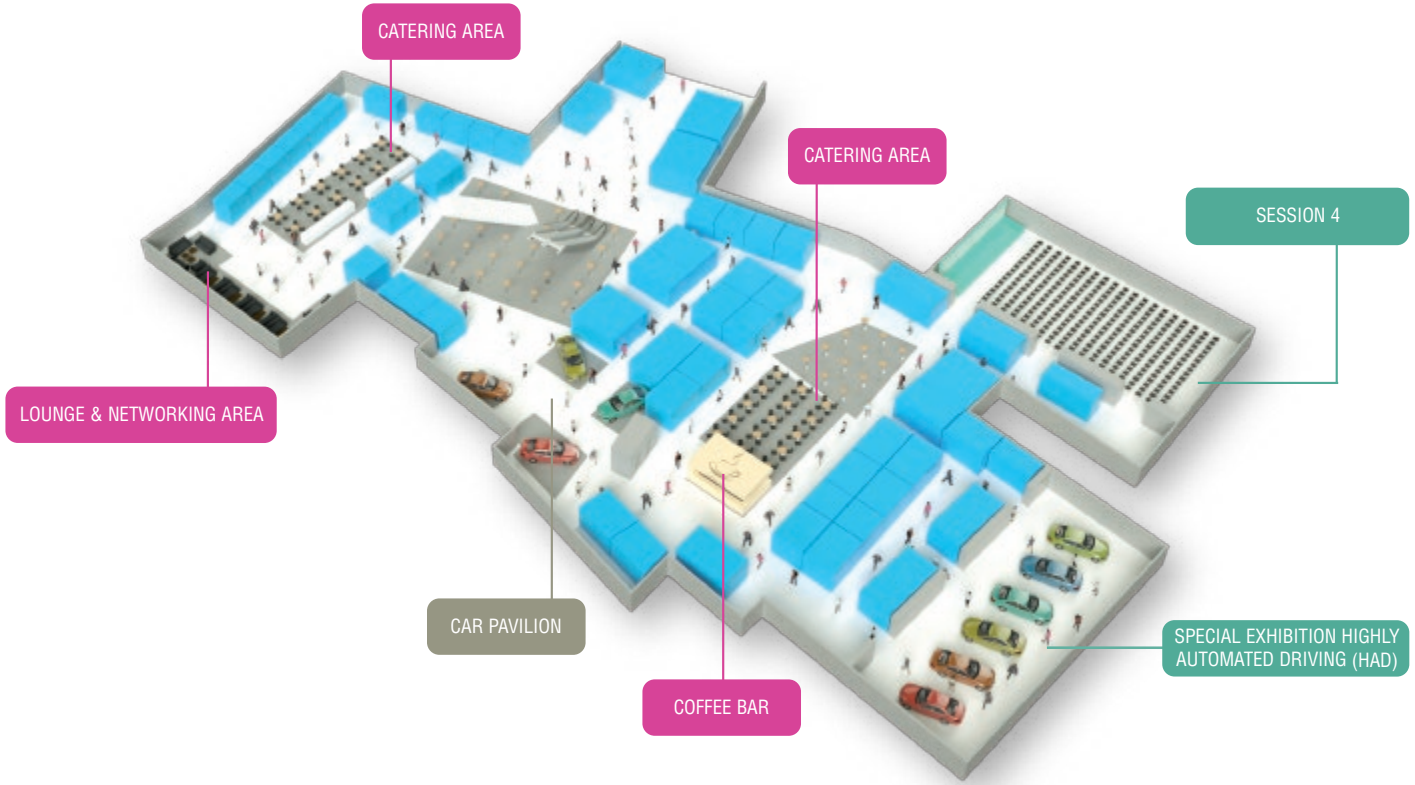

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