4th Advanced STEERING SYSTEMS 2010

• Advanced steering technologies • Standardisation and system comparison
• Electronic architecture and integration

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Hear 15 international leading companies and institutions:

• Audi AG
• Ford-Werke AG
• Magna Steyr AG & Co KG
• Magna Powertrain AG
• Robert Bosch GmbH
• Valeo Detection Systems
• Strategy Analytics
• Melexis N.V.
• Technische Universität Darmstadt
• PreeTEC GmbH
• FAST – Forschungsgemeinschaft für Außenwirtschaft, Struktur- und Technologiepolitik e.V.
• Regensburg University of Applied Sciences
• Anthony Best Dynamics Ltd.
• Continental Automotive GmbH
• Centro Ricerche Fiat S.p.A.

• Learn how growth potential in steering systems compares with other automotive electronic systems
• Discuss rear wheel steering versus torque vectoring to improve lateral vehicle dynamics
• Find out about new EPS technology trends and the potential of a low cost approach
• Gain insight the conception and development of a fail-degraded electrical steering system
• Get an overview of the challenges how to integrate driver assistance functions into active chassis systems
• Understand the requirements for current and future electric steering motors

Benefit from the following experts amongst others:

Dr. Uwe Pichler-Necek,
Global Product Manager
Chassis Control Systems,
Magna Powertrain AG, Austria

Jörg Eigenmann,
Director ED / EST Engineering
Steering Motors,
Robert Bosch GmbH, Germany

Dr.-Ing. Patrizio Turco,
Vehicle Control Systems
Department Manager,
Centro Ricerche Fiat S.C.p.A.,
Italy

Rolf Müller,
Safety Manager Electrical
Steering Systems,
Audi AG, Germany

Interactive Workshoptday I Wednesday, 24th November 2010
A Tire Modelling
B Driving robots for vehicle-, system-, ADAS-, misuse and durability testing
C Global chassis control and steering system: The integrated approach
D Electronical Power Steering

Conference advisor:
Prof. Dr.-Ing. Dr. h.c. Rolf Isermann,
Technical University of Darmstadt,
Germany
Dear colleague,

Electro-mechanical steering systems offer a substantial potential for reducing energy consumption. At the same time advanced steering systems make a great contribution toward component packaging, comfort and open new possibilities for assistance systems. And it is still a challenge for the automotive industry to use electro-mechanical and electric power steering in vehicles with peak performance in the premium segment.

The potential of meeting CO₂ legislation for passenger cars in 2014 (130 grams) and to reduce fuel consumption via an advanced steering system is really auspicious in this sector. Even more promising in regard to CO₂ reduction are electro hydraulic steering systems for trucks and trailers.

However a lot of crucial challenges still have to be mastered: The reliability of EPS and EHPS for front wheel steering as well as for rear wheel steering system and active steering has to be improved. And the systems require a solid integration in the chassis system and driver assistance systems. Therefore gain inside into new technologies and techniques to enhance your vehicle and its steering system on our:

International conference
STEERING SYSTEMS 2010
22nd November – 24th November 2010 | Dorint Pallas Wiesbaden

Don’t miss the opportunity to listen to case studies and discuss new technologies and methods with experts from Fiat, Audi, Magna Steyr, Robert Bosch GmbH, Continental, Ford Motor Company and many more.

• Listen to the best case studies about growing potential in steering systems with other automotive electronic systems
• Discuss with experts the future trends of EPS and other steering systems
• Hear case studies about optimized functionality and improved safety, handling and ride quality

We are looking forward to meeting you in Stuttgart.

Kind regards
Your AutomotiveIQ Team

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9:30  Registration & Coffee

10:00  Chairman’s welcome & opening address
        Prof. Dr.-Ing. Rolf Isermann,
        Technical University of Darmstadt, Germany

Market and Technology update

10:15  Steering System Market Dynamics: What is growing and why?
        • Learn how growth potential in steering systems
          compares with other automotive electronic systems
        • What is driving the market, and Why?
        • Discover which system types, regions and vehicle
          segments have the greatest potential
        • Hear Strategy Analytics’ views on emerging technologies
          such as steer-by-wire
        Ian Riches, Director Global Automotive Practice,
        Strategy Analytics, United Kingdom

Vehicle Dynamics Control – Advanced Steering Concepts

11:00  Vehicle dynamics control: An integrated approach
        • Integrated vehicle dynamics controller
        • Optimized and verified design process
        • Intelligent signal processing: Signal plausibilisation,
          vehicle dynamics observer
        • Simulation based optimization & test bench validation
        • Vehicle integration & test results
        Dr. Walter Rosinger, Project Manager Vehicle Dynamics
        Control,
        MAGNA STEYR Fahrzeugtechnik AG & Co KG, Austria

11:45  Refreshment break & networking

EPS architecture and system requirements

12:15  Steering force feedback systems: Alternative architectures and control approaches
        • EPS like and in axle actuator architecture comparison
        • Force feedback system modeling and identification
        • Model based control of in axle actuator
        • Robust loop-shaping H∞ controller of EPS like actuator
        Dr.-Ing. Patrizio Turco, Vehicle control systems
        Department Manager,
        Centro Ricerche Fiat S.C.p.A., Italy

13:00  Network luncheon

14:30  Development trends and specific challenges in electrical motor design for advanced steering
        system applications
        • Market trends
        • Requirements for current and future electric steering
          motors
        • Steering motors and steering motor development
          projects at Robert Bosch
        • Customized product features and functionalities
        • CAE application and tools
        Jörg Eigenmann, Director ED / EST Engineering
        Steering Motors,
        Robert Bosch GmbH, Germany

15:15  Advanced driver Assistance Systems for collision avoidance – The PRORETA approach
        • Mechatronic components of the chassis
        • Integrated chassis control
        • Diagnosis functions
        • Roadmap of driver assistance systems
        • Examples for new anti-collision driver assistance systems
        • Consequences for steering, braking and suspensions
        Prof. Dr.-Ing. Dr. h.c. Rolf Isermann,
        Institute of Automatic Control, Darmstadt University of
        Technology, Germany

16:00  Refreshment break & networking

Advanced Steering concepts

16:30  Advanced rear axle for improved lateral vehicle dynamics: Rear wheel steering versus torque vectoring
        • Design process for mechatronic actuation systems
        • Different approaches to control yaw rate
        • Vehicle test results
        • Mass production systems
        • Outlook
        Dr. Uwe Pichler-Necek, Global Product Manager Chassis
        Control Systems,
        Magna Powertrain AG, Austria

17:15  Panel-Discussion: The future of steering systems and enhanced functionalities
        Discuss with experts the actual concept and future trends
        of EPS and other steering systems
        Wolfgang Bongarth, Manager Global Core Steering
        Technology,
        Ford-Werke GmbH, Germany
        Dr. Heinz-Rudolf Meißner, Researcher,
        FAST – Forschungsgemeinschaft für Außenwirtschaft,
        Struktur- und Technologiepolitik e.V., Germany
        Dr. Uwe Pichler-Necek, Global Product Manager Chassis
        Control Systems,
        Magna Powertrain AG, Austria
        and speakers of the day

18:00  Closing remarks of the chairman
        and end of conference day one

The Dorint Pallas Wiesbaden invites you to an evening reception. This is an excellent opportunity for you to meet
the other attendees and make new business contacts.

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now at www.steering-conference.com/MM
8:45 Registration & Coffee

9:15 Chairman’s welcome & opening address
  Prof. Dr.-Ing. Rolf Isermann,
  Technical University of Darmstadt, Germany

9:30 EPS powerpack platform approach for global and newest technology setup including low cost needs
  • Continental CP 2.0 powerpack platform for rack and column EPS
  • Scalability for different rack forces
  • New EPS technology trends
  • Low cost approach
  • Global project and production setup for worldwide EPS platforms
  Heiko Jausel, Director Customer Center EPS Applications,
  Continental GmbH, Germany

10:15 Conception and development of a fail-degraded electrical steering system
  • Architecture of an electrical steering system
  • ASIL determination of “sudden loss of steering assistance”
  • Development of an advanced safety-concept
  • Description of the implemented safety measures
  • Verification and validation
  Rolf Müller, Safety Manager Electrical Steering Systems, Audi AG, Germany

11:00 Refreshment break & networking

11:30 Coupling of steering systems with driver assistance functions
  • Challenges of integration into active chassis systems
  • Requirements for vehicle architecture
  • Integration of electronics
  • µ-split situation
  Dr. Heinrich Gotzig, Technology & Expertise Director,
  Valeo Interior Controls,
  Valeo Detection Systems, Germany

12:15 Technology for high-end steering angle sensors
  • Overview of Melexis sensor portfolio for the automotive market
  • Description of integrated linear optical arrays in CMOS for steering angle and torque sensors
  • Tips & tricks using linear optical sensors for steering angle sensors
  • Market overview & comparison of linear optical arrays for steering angle compared to other technologies
  Sam Maddalena, Business Unit Manager,
  Melexis N.V., Belgium

14:30 Natural steering feel in a steer-by-wire sports car
  • Methods to determine steering wheel torque
  • Using steer-by-wire to improve steering feel
  • Results of experimental evaluation
  Tilo Koch, Engineer Advanced chassis engineering,
  Audi AG, Germany

15:15 Model-driven development and standardization efforts for steering systems
  • Overview and comparison of model-based approaches in the domain of safety-critical systems, including Matlab/Simulink, synchronous languages such as Esterel, AUTOSAR, SysML, the UML profile for embedded systems Marte, and the Timing Definition Language (TDL)
  • Achievements of full-fledged model-based development for steering systems with automatic platform mapping
  Prof. Dr. Wolfgang Pree, CEO,
  preeTEC, Austria

16:00 Refreshment break & networking

16:30 Modelling of a duplex electrical power steering prototype
  • Physical modelling and experimental parameter estimation
  • Model based fault detection of the EPS with accessible measurements
  • Architecture for a redundant duplex EPS-system with automatic reconfiguration
  • Hot stand-by redundancy principles
  Dipl. Ing. Mark Beck and
  Prof. Dr.-Ing. Dr. h.c. Rolf Isermann,
  Institute of Automatic Control,
  Darmstadt University of Technology, Germany

17:15 Panel Discussion: Steering Systems for Electrical and Hybrid Vehicles
  EV with and without wheel hub drive
  Which steering systems work best for Electric Vehicles?
  Which transformations of chassis architecture will be mandatory?
  Discuss with experts the actual steering concepts and future trends for EV and HEV
  Dr. Heinz-Rudolf Meißner, Researcher,
  FAST – Forschungsgemeinschaft für Außenwirtschaft, Struktur- und Technologiepolitik e.V., Germany
  and speakers of the day

18:00 Closing remarks of the chairman
  and end of conference day two

“You get interesting contributions and presentations about the steering market.”
  C. Elsen, NSK, Germany
Workshop A
10:00 – 13:00
Tire Modelling

The sufficient description of the interactions between tire and road is one of the most important tasks of vehicle modeling, because all the other components of the chassis influence the vehicle dynamic properties via the tire contact forces and torques. Today some handling and few complex structural tire models are available. The workshop will present "TMeasy" an easy-to-use tire model which generates tire forces and torques for any driving situation including steering maneuvers at stand-still. Usually, the tire model data will be fitted to measurements. Within TMeasy they also may be guessed by an engineer’s interpolation of a similar tire type if only some or no tire measurements are available.

- Tire road interaction
- Tire handling model
- Tire forces and torques

Prof. Dr.-Ing. Georg Rill, Faculty of Mechanical Engineering, Regensburg University of Applied Sciences, Germany

Workshop B
10:00 – 13:00
Driving robots for vehicle-, system-, ADAS- misuse and durability testing

The workshop will give an overview about the current technology and provide an outlook on future developments. How easy it is to use a robot and the associated software will be demonstrated with an ABD steering robot SR60 Torus.

- In-vehicle robot systems are widely used in both cars and trucks to guarantee accurate and reproducible tests. The systems are designed to enable OEMs, system and service supplier to carry out repeatable manoeuvres on the test track
- Steering, braking, throttle, and gear change robots can be used individually or simultaneously together depending upon project requirements
- Path following systems uses 2cm-accurate GPS to drive a vehicle through a pre-defined or taught in course over ground
- Autonomous test system allows dangerous and/or arduous tests to be performed without a driver in the vehicle
- SoftCrash-Targets synchronized with test vehicles allow realistic collision scenarios

Hermann Jäger, Technical Director, Anthony Best Dynamics Ltd., United Kingdom

Workshop C
14:00 – 17:30
Global chassis control and steering system: The integrated approach

The Global Chassis Control approach is discussed since many years in the automotive industry. Today other topics like fuel and CO₂ reduction as well as electric vehicles and products for emerging markets are more in the focus of management and customers. Therefore the developers have to struggle hard to find good arguments. Others are responsible for the subsystems in these concepts and ask themselves what are the effects on their products. This workshop shall offer a platform for exchange of information and opinions as well as help to sharpen arguments for further discussion in “daily life”.

- Global Chassis Control – definition and overview
- Continental demo car as example
- Functional architecture
- Different control structures
- Partitioning of functions to ECU’s – central vs. distributed approach
- What is the functional content of a “smart actuator”? – EPS as example
- What new requirements are expected for steering systems?

Thomas Kranz, Head of Project House Chassis Control, Base Development Chassis Control, Continental Automotive GmbH, Germany

Workshop D
14:00 – 17:30
Electronical Power Steering

The workshop will give an overview about the current technology and provide an outlook on future developments for electrical steering systems. This workshop invites you to discuss about the technology and the future development of modern steering systems.

- Current development
- Technical requirements such as sensors, electrical control unit and vehicle architecture
- New EPS technology Trends

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**4 Ways to Register**

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### Venue and Accommodation

**Venue**

Dorint Pallas Wiesbaden  
Auguste-Viktoria-Straße 15  
65185 Wiesbaden, Germany  
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Fax: +49 (0)611 3306 1000  
[www.dorint.com](http://www.dorint.com)

This modern and elegant first class hotel combines clear aesthetic design with exclusive hospitality. Central located, close to the Rhein Main Hallen. High level comfort in 298 rooms, including a presidential and 30 more suits. A total of 2000 sq. metres of state-of-the-art meeting facilities. A la carte restaurant “Steuben’s”, casual wine- and beer bar “Pinte”; “Garden View Bar” with live music. Relaxing spa facilities and underground parking.

Accommodation: A limited number of reduced rate rooms are available at the congress hotel. Accommodation can be booked by calling the central reservation number. Please always quote the booking reference IQPC-Berlin. Hotel accommodation and travel costs are not included in the registration fee.

### For further information

please visit our website  
or contact  
Mark Reichmann or Hannah Schädler on  
+49 (0)30 20 91 32 74 or email eq@iqpc.de.

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