Reinvent Alternate Drivetrain Management: Drivetrain Technology and Processes

Session Code: PT4
Room 02-33/44

Session Time: 2:00 p.m.

Enabling Technologies for Future Powertrain Electronics

The past was dominated by topics like OBD II, focusing on environmentally friendly emissions. Very principal work has to be done for fulfilling all needs, especially for the long term. Reinventing the car's powertrain means we have to look for all possibilities. These new technologies must allow the building of new real powertrains.

We have to look for optimal ecology as well as economy, optimized power and minimum consumption and safety; active as well as passive. What new technologies will help on the very principle task of engine control at its best? We should examine the sensor side as well as the actuator side, we should look for networking technologies and everything should be carefully considered from the perspective of product and process.

Is hardware, like direct injection or electrical valves, the only answer? Or have we more chances to solve the problems on the software side where topics like AUTOSAR can show a complete new direction?

Everything we recommend should be carefully analyzed for cost and a real 0 ppm strategy because our customer will only be convinced by a product which is both innovative and highly reliable, service friendly and cost optimized.

Organizers - Peter Thoma, Erhard Musch, ELMOS Semiconductor AG

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<td>2:00 p.m.</td>
<td>2006-21-0001</td>
<td>The Intelligent Battery Sensor: Key Component for a Scaleable, Motorvehicle-Independent Energy Management System</td>
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<td>Andreas Heim, Tilo Streibl, BMW Group</td>
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<td>2:30 p.m.</td>
<td>2006-21-0002</td>
<td>Battery Management and Controls</td>
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<td>2006-21-0003</td>
<td>Engine Control for Multiple Optimization Devices</td>
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<td>Stephen W. Magner, Stephen Cooper, Mrdjan Jankovic, Ford Motor Co.</td>
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<td>3:30 p.m.</td>
<td>2006-21-0004</td>
<td>How the need for Cost Effective CO² Emissions Reduction through Powertrain Hybridization Pushes for Innovative, Integrated and Robust Mechatronic Design</td>
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<td>Julien Pfiffer, Blaise Rouleau, Valeo Electrical Systems; Jean-Michel Morelle, Valeo Electronics and Connective Systems</td>
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<td>4:00 p.m.</td>
<td>2006-21-0091</td>
<td>Emerging Technologies in Alternate Drive Train Management: Power Capacitor Chip in Hybrid- and Fuel Cell Powered Drives</td>
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<td>Suresh Chandran, EPCOS Inc.; Harald Vetter, Epco AG</td>
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<td>4:30 p.m.</td>
<td>2006-21-0006</td>
<td>Key Factors to Improve Microcontroller Performance and Features</td>
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<td>Patrick Leteinturier, Infineon Technologies AG</td>
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Monday, October 16

International Standards (Part 1)

Session Code: CONV1
Room M2-30

Session Time: 2:00 p.m.
Increased functional scope to be made available by electric/electronic/software integration is triggered by passenger convenience, driver assistance, active safety systems, service support and/or legal requirements. In order to deliver a stable and reliable basis for such functional increase a forward design and open availability of automotive standards is mandatory.

The session is addressing these E/E automotive standards and will provide a forecast on the impact for the automotive industry.

Key topical areas are:
- International Standards like AutoSAR, FlexRay, the status, achievements and future role
- Infrastructure of software architecture
- Standardization of hardware
- Exploitation of standards - JASPAR
- In field experience
- Infrastructure software architecture
- Upgradeability

Electronics content in vehicle interiors is increasing dramatically due to the emergence of telematics systems that enable access to information outside the vehicle as well as the rapid migration of consumer electronics into the automotive environment. Certain questions and challenges emerge as these trends manifest themselves:

- How will automotive interiors keep pace with the rate of change of technology in the electronics industry? How must future vehicle systems be architected to fully leverage emerging electronics technologies?
- How will the automotive industry develop standards that enable integration consumer electronics without compromising the integrity of the vehicle’s electrical system?
- How will these standards support Plug and Play devices from both an electrical and physical integration perspective?

This session will explore such issues and offer prospective solutions.

**Organizers** - Harald Heinecke, Bayerische Motoren Werke AG

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<td>2006-21-0018</td>
<td><strong>Standards Development in the New Vehicle Communications Environment</strong></td>
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<td>Michael Noblett, Connexis LLC</td>
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<td>2:30 p.m.</td>
<td>2006-21-0019</td>
<td><strong>Achievements and Exploitation of the AUTOSAR Development Partnership</strong></td>
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<td>Helmut Fennel, Stefan Bunzel, Continental; Harald Heinecke, Juergen Bielefeld, Sin, BMW Group; Klaus-Peter Schnelle, Walter Grote, Nico Maldener, Bosch; Thomas V. Florian Wohlgemuth, Jens Ruh, DaimlerChrysler; Lennart Lundh, Thomas Sanden, Company; Peter Heitkaemper, Robert Rinkus, General Motors; Jean Leflour, Alain PSA Peugeot Citroen; Ulrich Vinnich, Stefan Vogt, Siemens VDO; Kenji Nishikawa, Kajjo, Toyota Motor Corporation; Klaus Lange, Thomas Schamhorst, Bernd Kunkel, Volkswagen</td>
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<td>3:00 p.m.</td>
<td>2006-21-0020</td>
<td><strong>Significance of Electronics Platform and the Motivation for JasPar</strong></td>
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<td>Toshimi Abo, Nissan Motor Co., Ltd.; Hiroshi Tanigawa, Toyota Motor Corp.; Hiroshi Hashimoto, Honda R&amp;D Co., Ltd.</td>
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<td>3:30 p.m.</td>
<td>2006-21-0021</td>
<td><strong>OSEK: A Standard in the Field</strong></td>
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<td>Pierre Malaterre, PSA</td>
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<td>4:00 p.m.</td>
<td>2006-21-0022</td>
<td><strong>FlexRay - From Principles to Products</strong></td>
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<td>Christopher Temple, Florian Bogenberger, Mathias Rausch, Freescale Semiconductor; Oleksandr Sakada, Freescale Halbleiter Deutschland GmbH; Thomas A. Wuerz, Mark Jordan, Freescale Semiconductor</td>
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**Monday, October 16**

**Reinvent Infotainment: Reinvent Infotainment Architecture**

**Session Code:** I1

**Room M3-31/32**

Electronics content in vehicle interiors is increasing dramatically due to the emergence of telematics systems that enable access to information outside the vehicle as well as the rapid migration of consumer electronics into the automotive environment. Certain questions and challenges emerge as these trends manifest themselves:

- How will automotive interiors keep pace with the rate of change of technology in the electronics industry? How must future vehicle systems be architected to fully leverage emerging electronics technologies?
- How will the automotive industry develop standards that enable integration consumer electronics without compromising the integrity of the vehicle’s electrical system?
- How will these standards support Plug and Play devices from both an electrical and physical integration perspective?

This session will explore such issues and offer prospective solutions.

**Organizers** - James R. Geschke, Johnson Controls Inc.
As vehicle populations continue to rise in all regions of the world the social/economic factors of Safety also continue to escalate. Demands for safer vehicles are both customer driven and regulatory based. These demands vary widely throughout the world yet world wide OEM's must assure all forms of compliance. The challenge to the OEM is to deliver these safety features with high reliability and minimal costs. In addition, the OEM's must homologate their applications to assure each region is satisfied with the results. Thus the NEED for the right technology versus the right regional demands must be addressed by the industry.

- How will the OEM's generate universal solutions that meet regional requirements in one area but do not over burden the product in another area?
- How will regulations be set to align requirements world wide thus minimizing the complexity of solutions?
- How will technologies influence the regulations as well as the Customer demands for future solutions?
- What other factors (environment, population, competition, etc) will influence the demands for future solutions?

The session will explore such issues and offer prospective solutions.

**Monday, October 16**

**Reinvent Safety Systems: The Need**

**Session Code:** SS1

**Room O3-45/46**

**Session Time:** 2:00 p.m.

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**Time** | **Paper No.** | **Title** |
--- | --- | --- |
2:00 p.m. | 2006-21-0013 | A Reference Architecture for Infotainment Systems  
Dennis Selin, Helen Svensson, Petter Sundsten, Allan Wikström, Ulrik Eklund, Volvo Car Corp.
2:30 p.m. | 2006-21-0014 | 100 Million Smart Assistants on Wheels  
Roberto Sicconi, IBM
3:00 p.m. | 2006-21-0015 | An Open Telematics Development Framework: Universal and Affordable: How To Make It Happen  
Liang X. Downey, Larry Lehman, Wind River
3:30 p.m. | 2006-21-0016 | Building Secure, Survivable Infotainment and Telematics Systems  
Mark Roberts, QNX Software Systems
4:00 p.m. | 2006-21-0017 | A Shift From Providing to Enabling In-Car Infotainment in the Future  
Wieland Holfelder, DaimlerChrysler RTNA Inc.; Matthias Stuempfe, DaimlerChrysler AG
Monday, October 16

Keynote Address - Converging on Sustainability: The Time is Now

Session Code: CONVK1

Room Riverview Ballroom  Session Time:  9:10 a.m.

Keynote Speakers - Lawrence D Burns, Vice President, R & D and Strategic Planning, General Motors Corp.

Monday, October 16

Blue Ribbon Panel: Challenges and Opportunities in Supplier and OEM Cooperation in the Field of Embedded Electronic Software Controls

Session Code: BR

Room Riverview Ballroom  Session Time:  10:00 a.m.

The use of embedded controls continues to increase in the automobile and the amount of interaction and interdependence of the traditional subsystems also is increasing. The previous industry trend was that for every new major feature or function, a corresponding electronic control module with corresponding software was developed and provided by a supplier. The new trend is to focus more from a functional perspective with the desire both for functional transportability and integration and more OEM involvement and definition in the functional requirements. This OEM trend is at the same time that Suppliers continue to develop their features and functions and desire to have more responsibility of the subsystem and integration into the vehicle. With this potential overlap of desires, significantly more cooperation is required between the OEM and Suppliers to enable a "win-win" situation, leveraging their collective strengths.

Organizers - Ronn Jamieson, Director, GM North America HVAC; Patrick Popp, Director - Body, Safety, and HVAC, Electronics Product Development, General Motors Corp.

Moderators - Gerhard Schmidt, Vice President, Research and Advanced Engineering, Ford Motor Co.

Panelists - Hans-Georg Frischkorn, ED Global Electrical Systems, Controls and Software, General Motors Corp.; Karl-Thom Reitmaier, CEO, Continental Teves AG & Co. oHG; Jeffrey J. Owens, President, Delphi Electronics and Safety; Wolfgang Runge, Exec Officer Steering Gears Div., Euro Elect intl Conf in Cars, ZF Friedrichshafen AG

Tuesday, October 17

Reinvent Alternate Drivetrain Management: Technology & Components for Innovative Drivetrains

Session Code: PT1

Room 02-33/44  Session Time:  9:00 a.m.

Requirements issued by drivers with regard to the functions of the vehicle are constantly on the rise and they are further developing. Here, major features depending to the drivetrain are driving dynamics and pleasure, comfort, reduction of emissions fuel and consumption.

Regarding reductions in consumption and emissions, main topics are new developments in gasoline and diesel engines, hybrid systems and transmissions, as well as new functionalities as Start / Stop Systems, regenerative braking are in development. To optimize dynamics and traction the number of four wheel driven cars will increase.

All these approaches are based on a reinfored utilization of electronics in the automobile. Since there is usually no solution to be found for conflicting requirements by means of mechanical components, the aggregates, i.e. units used must be strategy-compatible which means: Electronics - and here it is mostly software - will consistently replace mechanics. However, space in the vehicle as such is rather limited. In the future, electronic control units must be increasingly integrated in the units, i.e. aggregates. Quality-related development of mechatronic software-based components will evolve as the significant core competence of the future. Other main issues are model-based feedback control functions and new components, actuators, electric motors and sensors.

The interplay between drivetrain and chassis and multiverse of sensor information and the overall vehicle is opening up new dimensions for vehicle-based functions. The resulting high level of complexity calls for clear rules and multidisciplinary cooperation. And this process does not only affect the level of cooperation between the vehicle manufacturer and the supplier but also the degree of networking amongst suppliers themselves. The major buzzwords and areas of activity are: "Distributed development of distributed systems" and "Networks based on partnership".

Organizers - Wolfgang Runge, ZF Friedrichshafen AG; Rob Smith, TYCO Electronics AMP GmbH
Increased functional scope to be made available by electric/electronic/software integration is triggered by passenger convenience, driver assistance, active safety systems, service support and/or legal requirements. In order to deliver a stable and reliable basis for such functional increase a forward design and open availability of automotive standards is mandatory.

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- Infrastructure of software architecture
- Standardization of hardware
- Exploitation of standards - JASPAR
- In field experience
- Infrastructure software architecture
- Upgradeability

Organizers - Harald Heinecke, Bayerische Motoren Werke AG

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<td>2:00 p.m.</td>
<td>2006-21-0039</td>
<td>Flex Ray - Exploitation of a Standard and Future Prospects</td>
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<td>Walter Kuffner, Gunter Reichart, Josef Berwanger, Martin Peteratzinger, Anton Schmitz, Bayerische Motoren Werke AG</td>
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<td>2:30 p.m.</td>
<td>2006-21-0040</td>
<td>FlexRay - A Standard Becomes Reality: First Experiences with the Implementation of Real Network Architectures</td>
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<td>Lutz Leutelt, Philips Semiconductors GmbH; Hannes Wolff, Bernd Elend, Philips Semiconductors; Peter Fuhrmann, Philips Research Laboratories; Thomas Suermann, Philips Semiconductors GmbH</td>
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<td>3:00 p.m.</td>
<td>2006-21-0041</td>
<td>Design Tool and Software Platform for Time-Triggered Network Systems</td>
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<td>3:30 p.m.</td>
<td>2006-21-0042</td>
<td>Time-Triggered Architecture based on FlexRay: Roadmap from High-Speed Data Networking to Safety Relevant Automotive Applications</td>
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<td>Markus Buhlmann, Audi AG; Stefan Poledna, Georg Stoeger, Roland Wolfig, TTAutomotive Software GmbH</td>
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</table>
While the networks of today's vehicles have achieved a high level of systems maturity, they also continue to demand more bandwidth for computing and communication. This session explores the many emerging alternatives for Digital Connectivity as follows:

- Connectivity within the vehicle subsystems (copper, optical, wireless)
- Vehicle to Driver/Passenger connectivity (visual, audio, haptic)
- Vehicle to Vehicle connectivity drives the need for standards
- Vehicle to Infrastructure connectivity (terrestrial, satellite)
- Connectivity for Consumer devices - How? When? Where?

How does anyone pick the winners in this world of many specialized solutions? This session covers a wide range of technology alternatives and potential answers.

Organizers - Myron U. Trenne, Yazaki North America Inc.; Andrew Macdonald, General Motors Corp.

Time | Paper No. | Title
--- | --- | ---
9:00 a.m. | 2006-21-0034 | Digital Connectivity Trends for In-vehicle Systems
9:30 a.m. | 2006-21-0035 | The Intelligent Cockpit - Design Meets Digital Information
10:00 a.m. | 2006-21-0036 | New Platform for High Quality Satellite TV Reception and Data Connectivity in Moving Vehicles
10:30 a.m. | 2006-21-0088 | Towards a Converged Telematics Services Architecture: Opportunities & Challenges
11:00 a.m. | 2006-21-0037 | Bridging the Commercial Aircraft Connectivity Gap
Safety like quality is a basic market driven demand from all customers. Safety systems like antilock braking, airbag restraint systems, anti-roll technologies have become standard in the industry. The convergence of many technologies is abound in these standard vehicular safety systems. Original equipment manufacturers can distinguish their brands in the marketplace by enhancing fundamental safety systems and making available optional safety features beyond those required by regulation.

As we look forward, the possibilities to take further advantage of convergent technologies and their application to automotive safety is at hand. New opportunities exist to offer passengers and pedestrians a safer mobile environment. Advances in remote sensing, high speed data processing, miniaturization, wireless and satellite networks, and cost effectiveness are all contributing to development of new safety systems for automotive application.

The Reinventing Safety Systems Session will address the enablers to permit the industry to invent and re-invent safety systems for the future. Those enablers may include analysis and discussion on the development and application of new semiconductor technologies (high speed digital signal processing, MEMS, image processing, sensing [RF, biometrics, infrared, optical, etc...]), needs for high speed data transfer and secure and redundant networking, processes for robust software application development (modeling, validation), or studies of cost, reliability and availability tradeoffs in these enabler areas.

Enablers may also include extra-vehicular interactions including traffic flow management, and remote polling for diagnostics and service.

Reinvent Safety Systems: Process

Session Code: SS3
Room O3-45/46
Session Time: 2:00 p.m.

As we look forward to the "reinvention" of Safety Systems, the emphasis will be placed on the addition of active safety systems to not only provide added functionality but to also support Passive Systems for improved performance. The opportunity for the "Sum to be greater than the parts" is clear, but the process used will be critical to provide a high quality, robust product to the consumer which meets the commercial and technical requirements of the OEM's and Suppliers.

This session will seek to explore the issues, challenges and requirements to develop and release highly integrated systems onto vehicles including areas such as:

- Methods and Tools (simulation, testing)
- Standardization - specifications, interfaces, etc.
- Integration of multiple suppliers into a system
- Interactions with non-safety systems (displays, navigation, telematics, etc.)
- Reusability/adaptability of algorithms
- Validation and Prove-out including regional needs

Organizers - Robert M. Rivard, Robert P. Lyons, Robert Bosch Corp.

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<td>2006-21-0045</td>
<td>Evaluation of Hazard Identification Methods in the Automotive Domain</td>
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<td>Fredrik Törner, Volvo Cars Corp.; Per Johannessen, Volvo Car Corp.; Peter Öhman, Univ. of Technology</td>
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<td>2006-21-0046</td>
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<td>Arnab Ray, Fraunhofer Institute for Experimental Software Engineering; Walter Ramandewa, Univ. of Maryland; Shengbing Jiang, Thomas Fuhrman, General Motors</td>
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<td>3:00 p.m.</td>
<td>2006-21-0047</td>
<td>Prototyping and Simulation as a Means of Software Verification</td>
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<td>Hans-Joerg Wolff, ETAS GmbH &amp; Co. KG; Michael H. Smith, ETAS Inc.</td>
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<td>3:30 p.m.</td>
<td>2006-21-0048</td>
<td>Utilizing Driving Simulators in the Development and Evaluation of Advanced Safety Systems</td>
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<td>Christopher Schreiner, Kari Torkkola, Mike Gardner, Bob Leivian, John Summers, Mike Chip Wood, Info Inc.; Keshu Zhang, Motorola</td>
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<td>4:00 p.m.</td>
<td>2006-21-0049</td>
<td>Field Operational Tests - Evaluating Driver-Assistance Systems Under Real World Conditions</td>
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<td>David Leblanc, Timothy Gordon, James R. Sayer, Christopher B. Winkler, M. Hagarty, Chip Wood, Info Inc.; Keshu Zhang, Motorola</td>
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Tuesday, October 17

Keynote Address - Inspire the Next --A Vision for the Next Automotive World
Session Code: CONVK2
Tuesday, October 17

**Moderated Panel - "Car Makers Speak"

*Session Code: MP*

**Room Riverview Ballroom  Session Time: 8:15 a.m.**

A plenary session, the Car Makers Speak Moderated Panel has been one of the highlights of Convergence. Consisting of top electrical engineers from the world's major carmakers in a lively give-and-take, the panelists will discuss a number of vital subjects including global E/E standards, the challenges carmakers face, how suppliers can help, the commoditization of operating systems and electronic control units, along with some of the major trends of the day.

**Organizers** - Paul M. Hansen, The Hansen Report on Automotive Electronics

**Moderators** - Paul M. Hansen, The Hansen Report on Automotive Electronics

**Panelists** - Toshimi Abo, Deputy General Manager, Electronics Engineering Division, Nissan Motor Co., Ltd.; Ronn Jamieson, Director, GM North America HVAC, General Motors Corp.; William H. Mattingly, Vice President, Electrical/Electronics Engineering, DaimlerChrysler Corp.; Toyohei Nakajima, Senior Chief Engineer, Honda R&D Co., Ltd.; Graydon Reitz, Director, Electronics Systems Engineering, Ford Motor Co.; Woong-chul Yang, Vice President, Automotive Electronics Center, Hyundai Motor Co.

**Session Time:** 12:00 p.m.

Tuesday, October 17

**Innovative Vehicle Design (part 1 of 2)**

*Session Code: VII/V2V DEMO*

**Room TBD  Session Time: 2:00 p.m.**

Sponsored by NAVTEQ

Convergence 2006 features a new and exciting project for youth, designed to stimulate innovative thinking through design and engineering. The Innovative Vehicle Design program unites high school teams with corporate partners around the design and building of a one-person, electric vehicle. Built as an innovation, not racing competition challenge, the IVD program allows each team a 10 month build window where students assume the leadership for all portions of the planning and development.

Corporate support includes professional coaching from 2 to 4 engineers and a $5,000 financial contribution that is matched by the CEF board of directors. The $10,000 budget per team must be spent using 90% of the funds for the car, and 10% to be used for an Engineering Ambassador-ship where high school students influence middle-school students in their districts.

Wednesday, October 18

**Reinvent Alternate Drivetrain Management: MidTerm Drivetrain (2015)**

*Session Code: PT2*

**Room 02-33/44 Session Time: 9:00 a.m.**

**Room Riverview Ballroom  Session Time: 9:00 a.m.**
The focus of this session is Next Generation Drivetrain Technology. Customer expectations, customer acceptance, and perceived value of improvements in drivetrain technology will be considered. The role of government regulations and government incentives will also be presented.

The technology focus should explore the potential of hybrid propulsion systems as well as the possibilities of new generations of diesel engines. How much improvement is possible? What electronics technology breakthroughs are required to facilitate new drivetrain technologies? The ability to introduce new transmission strategies, such as independent wheel drive, due to improvements in engine technology will also be reviewed.

New insights on Fuel Cells or an analysis of the infrastructure needed to deploy this technology will be presented. Will automotive lead the technology development or will we learn from other industries? Who will lead the deployment? What industries or applications should we be studying and what can we expect to learn?

This session will also address the challenges and complexities of various technologies co-existing. Research that addresses these topics or other next generation drivetrain solutions will be considered.

Organizers - Liu Qiao, Kenneth Roy Butts, Toyota Technical Center USA Inc.

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<td>2006-21-0056</td>
<td>U.S. Powertrain Trends and the Consumer's Perception of Alternative Powertrain Technologies</td>
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<td>9:30 a.m.</td>
<td>2006-21-0057</td>
<td>DOE Research Strategy: Mid- and Long-Term Petroleum Savings</td>
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<td>10:00 a.m.</td>
<td>2006-21-0058</td>
<td>Advancing the State of Strong Hybrid Technology</td>
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<td>10:30 a.m.</td>
<td>2006-21-0059</td>
<td>Advanced Electronics for Clean Diesel Engine Management System</td>
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<td>11:00 a.m.</td>
<td>2006-21-0060</td>
<td>Advances in HEV Battery Management Systems</td>
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Wednesday, October 18

Reinvent Alternate Drivetrain Management: Long Term Drivetrain

Session Code: PT3

Room 02-33/44  Session Time: 2:30 p.m.

Rethinking Propulsion for Personal Transportation

The target of this session is to reach past current solutions to focus on the years beyond 2015. The focus is on revolutionary ideas to better utilize vehicle energy and power, create new ways for man to interface to his vehicle and the surroundings and improving the environment. This session dares the members to totally rethink personal transportation.

The topics will range from using the vehicle as a personalized tool for mobility to developing power sources that reduce or eliminate pollution. This session will also explore whether consumers will enhance, accelerate, or impede new technologies. An analysis of the factors that create customer enthusiasm for new products must be considered. The cost factors can also be explored in the context of the value consumers perceive for various improvements.

The reinvention of Powertrain systems will have a lasting impact on society and our environment and the ideas discussed in this forum will shape the future of Powertrain.

Organizers - Reinhard Ploss, Infineon Technologies AG; Christopher S. Cook, Infineon Technologies

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<td>2:30 p.m.</td>
<td>2006-21-0089</td>
<td>Transportation Fuels for the Future</td>
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Klaus Scheuerer, Holger Braess, BMW Group
The Asia-Pacific region is looming as a center for growth and product development for automotive industry participants. Examination of the technical and business trends in China and India, and forecast opportunities for the need of increasingly complex electronic control software in automotive components will be explored along with the trends, developments and critical challenges in automotive software due to the dramatic increase in digital consumer electronics found in automotive applications. We'll discuss the fact that many global companies are shifting production to Asia in order to pursue vast market potential and to remain competitive globally. To do this they must take energy costs, conservation and the environmental situation in China and India, and their effect on market perceptions regarding industrial and vehicle hybrid technology, and market needs in the automotive industry into account as critical elements of this sustained expansion.

This session provides a focused and timely forum for researchers to exchange ideas and discuss emerging business opportunities, market challenges, future developments and industrial practices in the area of emerging technology (ECS, and Hybrid energy, etc.), with particular emphasis on applications in China and India. Participants will gain more knowledge in a number of key issues and strategies in order to more effectively anticipate or meet market requirements around the world.

Potential topics include, but are not limited to:

1. Automotive Technology sustainability in China (inventions, intellectual property rights, etc)
2. IT & Consumer Electronics/Telematics: how to link with automotive electronics
3. Hybrid vehicle technologies and market requirements
4. Energy and environment situation in India/in China
5. China, emerging giant in technology
6. Standardization of user interfaces - e.g., radio, telephone, NAV systems, etc.

Organizers - B. G. Prakash, General Motors, Corp.; Rudolph von Meister, IVECO China

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<th>Paper No.</th>
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<tr>
<td>2:30 p.m.</td>
<td>2006-21-0085</td>
<td>Organizational Transformations in Response to Shifting Global Demands</td>
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<td>3:00 p.m.</td>
<td>2006-21-0086</td>
<td>Global Research and Development: GM Case Study India</td>
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<td>3:30 p.m.</td>
<td>2006-21-0092</td>
<td>Motorola’s Experiences Building Up a Strong Automotive R&amp;D Engineering</td>
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<tr>
<td>4:00 p.m.</td>
<td>2006-21-0093</td>
<td>How Can Lean Process Bring in Value?</td>
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Reinvent Infotainment: Content/Services

Session Code:  I4
Room M3-31/32  Session Time:  9:00 a.m.

Recent advances in wireless communications, digital compression, and data storage technologies are revolutionizing the infotainment experience in the transportation industry.

Just a few years ago, consumers had few choices: AM/FM broadcast or CD/Cassette playback for audio entertainment. Today, consumers can receive hundreds of digital audio programs and digital data streams such as traffic, weather, and financial information via satellite radio.

Rear seat video is also available via DVD playback or satellite/terrestrial digital broadcast. In the future, the introduction of WiFi, 2-way satellite communications, and hard disc drives in vehicles will enable delivery of entertainment and transportation information on demand.

New value streams integrating the vehicle infotainment electronics business with content service providers in the cable TV, high speed internet, and satellite broadcast industries may obsolete the current “bricks and mortar” business of distributing entertainment via plastic discs through traditional retail storefronts.

In this session, we will examine the technical and business trends behind this convergence and forecast opportunities for vehicle infotainment electronics suppliers and content providers to create new value streams and business models.

Specific topics will include:

- Vehicle Infotainment Electronics Trends and Opportunities
- Advanced Satellite Broadcast Services
- Digital Terrestrial Broadcast Opportunities
- Audio and Video On Demand Via WiFi: Cable TV Goes Mobile
- Advanced Transportation Information Services
- Diagnostics and Commercial Transactions

Organizers - Robert W. Schumacher, Delphi Electronics and Safety

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<th>Time</th>
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<tr>
<td>9:00 a.m.</td>
<td>2006-21-0067</td>
<td>Automotive Infotainment Trends &amp; Opportunities Driven by Integrated Media Content Availability</td>
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<td>Kenneth L. Erickson, Jay Adams, John D. Ramseyer, John A. Yurtin, Delphi Delco Electronics and Safety</td>
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<td>9:30 a.m.</td>
<td>2006-21-0068</td>
<td>XM Satellite Radio Technology and Content Evolution</td>
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<td>Stuart Cox, XM Satellite Radio Inc.; Stell John Patsiokas, XM Satellite Radio</td>
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<tr>
<td>10:00 a.m.</td>
<td>2006-21-0069</td>
<td>ONDAS - Mobile Media Revolutionizing European Radio Habits</td>
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<td>Celso Azevedo, Ondas</td>
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<td>10:30 a.m.</td>
<td>2006-21-0070</td>
<td>HD Radio as an Infotainment and Telematic Delivery Method and Its Opportunity to Deliver Unique Local Content</td>
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<td>Jeff McGannon, Joseph F. D'Angelo, Ibiquity Digital; Michael S. Geylin, Kermish-Geylin Public Relations Inc.</td>
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<td>11:00 a.m.</td>
<td>2006-21-0071</td>
<td>Digital Maps - The Next Generation</td>
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<td>Mohammed Salahuddin Khan, NAVTEQ Corp.</td>
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<tr>
<td>11:30 a.m.</td>
<td>2006-21-0072</td>
<td>Location, Diagnostics, and Commercial Transactions - Content Services for Business</td>
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<td>Rich Carlson, Wireless Matrix Corp.</td>
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Reinvent Safety Systems: Roadblocks

Session Code:  SS4
Room O3-45/46  Session Time:  9:00 a.m.
In the auto industry, key factors of differentiation amongst the competition are cost of ownership, innovation, quality and safety. Herein safety plays an important role. On the one hand, customers expect a safe product -- safety is the price of entry into the market. On the other hand, safety and safety systems are still rapidly evolving and are a means of product differentiation. Besides customer demands there are also mandatory regulatory requirements which must be met.

Safety as it is known in most vehicles today is passive safety: A solid vehicle structure, restraint systems, frontal driver and passenger airbags, and side curtain airbags. A defining factor of passive safety is that it attempts to mitigating injury to the driver or passenger once the accident in imminent.

ABS and traction control systems were the starting point of active safety. Today, state of the art systems such as brake assist, ESP and roll mitigation are being offered in order to assist the driver in accident avoidance. In general, the purpose of an active safety system is to avoid accidents or to mitigate the severity of the accident before it occurs.

These two fields, passive and active safety, were separate in the past. In the future, these areas will be combined thus leading to a more integrated and holistic approach to safety.

Signals from the ESP system can be used to precondition the passive safety systems. Sensor information from systems like adaptive cruise control, LIDAR or RADAR based, can be used not only for preconditioning of passive safety systems but also to support active safety systems and to define new safety related functionalities.

This approach to safety, combining passive and active safety elements will create a completely new field and new opportunities to better protect the driver and passengers.

To follow this roadmap to improved safety, certain roadblocks need to be overcome which will be discussed in detail during the presentation. Such hurdles include:

- Cost
- HMI and customer acceptance
- Regulatory influence
- Global infrastructure / supply base
- Organizational structure at OEM

Organizers - William H. Mattingly, Michael J. Cairns, Edward Griffor, DaimlerChrysler Corp.

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<td>9:00 a.m.</td>
<td>2006-21-0061</td>
<td>Reinventing Safety Systems: Roadblocks; Organizational Structure,</td>
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<td>Data Analysis Bias, and Systems Integration</td>
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<td>Sean A. Bannon, DaimlerChrysler Corp.; Mark Huber, DaimlerChrysler</td>
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<td>Truck Platform Engrg; Guy S. Nusholtz, DaimlerChrysler AG; Susan G.</td>
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<td>Yester, DaimlerChrysler Corp.</td>
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<tr>
<td>9:30 a.m.</td>
<td>2006-21-0062</td>
<td>Tort Reform and Motor-Vehicle Deaths</td>
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<td>Paul Rubin, Joanna M. Shepherd, Emory Univ.</td>
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<td>10:00 a.m.</td>
<td>2006-21-0063</td>
<td>Re-Thinking Traffic Safety: the Global Situation, the Behavioral</td>
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<td>Model, Strategies for Improvement</td>
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<td>Robert Perry Green, Skip Barber Racing School</td>
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<td>10:30 a.m.</td>
<td>2006-21-0064</td>
<td>Toward a Science of Driving: Safety in Rules-Based versus Adaptive</td>
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<td>Self-Regulating Traffic Systems</td>
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<td>Walter S. McManus, UMTRI; Edward Griffor, DaimlerChrysler Corp.</td>
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<td>11:00 a.m.</td>
<td>2006-21-0065</td>
<td>New Safety Technologies for the Automotive Industry</td>
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<td>Nancy G. Leveson, Massachusetts Institute of Technology</td>
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Wednesday, October 18
<OL>
<LI>Merge of active and passive safety and telematics
<UL>
<LI>Networking of active and passive safety systems.
<LI>Usage of telematics, GPS, environmental sensors.
</UL>
<LI>Evolution of active safety systems:
<UL>
<LI>Hydraulic brakes, electronic brake control systems, accident avoiding systems.
</UL>
<LI>Evolution of passive safety systems:
<UL>
<LI>Mechanical restraint systems, electronic restraint systems, (i.e. airbag, reversible seatbelt tensioner, etc.)
</UL>
<LI>Driver assistance systems, ACC, etc.
<LI>Usage of different kind of sensorics and additional information.
</UL>
<LI>HMI (safety) Human Machine Interface
<UL>
<LI>Haptic feedback for the driver, during the activation of active systems.
<LI>What should be influenced by the driver or his passengers during driving?
<LI>Switch-off of active functions, inhibit passive functions, modify intervention thresholds.
<LI>What kind of warning acoustical, visual, force feedback for what purpose?
<LI>Head-up displays.
<LI>Balanced information load: driver information and driver warning during critical driving situations.
<LI>Adaptive HMI concepts to different kinds of customer segments and markets.
</UL>
<LI>Driver (Customer) in the loop
<UL>
<LI>Monitoring of the driver behaviour (reaction time, danger of sleep, eye supervision) with on-board cameras and appropriate other sensors.
<LI>Autonomous driving strategies in case of dangerous situations.
<LI>Keeping driver autonomy for the vehicle while support for driver assistance functions.
</UL>
<LI>Customer education
<UL>
<LI>What should be educated, who should educate, where does this education take place?
<LI>Groups/institutions to be involved: government, NHTSA, auto clubs, insurance companies, the automotive industry.
<LI>Communication and marketing of customer benefits.
<LI>Technology and its environment: lower insurance fees, tax benefits, NHTSA ruling.
<LI>Driving schools education, marketing campaigns from OEMs and suppliers.
<LI>Public awareness activities.
</UL></OL>


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<td>2:30 p.m.</td>
<td>2006-21-0079</td>
<td><strong>Active Safety Systems - The Home for Global Chassis Control</strong></td>
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<td>Juergen Diebold, Continental Automotive Systems</td>
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<td>3:00 p.m.</td>
<td>2006-21-0080</td>
<td><strong>Active Intervention into Passive Systems: From Passive Safety to Safe Driving</strong></td>
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<td>Michael Paul Bruce, Takata Holdings Inc; James P. Karlow, Takata Corp; Benedikt Dirk Meißner, Takata Europe; Tadahiro Igawa, Takata Corp</td>
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<td>3:30 p.m.</td>
<td>2006-21-0081</td>
<td><strong>Driver State Assessment and Driver Support Systems</strong></td>
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<td>Harry Zhang, Motorola Research Labs; Matthew R. Smith, Gerald J. Witt, Delphi Electronics and Safety</td>
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<tr>
<td>4:00 p.m.</td>
<td>2006-21-0082</td>
<td><strong>Predictive Safety Systems: Convenience - Collision Mitigation - Collision Avoidance</strong></td>
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<td>Peter Michael Knoll, VP Development, Driver Assistant Systems, Robert Bosch GmbH</td>
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<td>4:30 p.m.</td>
<td>2006-21-0083</td>
<td><strong>Innovative Safety Concept and Solutions</strong></td>
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<td>Takao Asami, Yousuke Akatsu, Nissan Motor Co., Ltd.</td>
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<td>5:00 p.m.</td>
<td>2006-21-0084</td>
<td><strong>Improving Safety in the Next Generation Vehicle Network</strong></td>
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<td>Utayba Mohammad, Nizar Al-Holou, Rami Baroody, Univ. of Detroit Mercy</td>
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Wednesday, October 18

Keynote Address - Rick Wagoner, CEO, General Motors Corp.
Session Code: CONVK4
Room Renaissance Ballroom Session Time: 8:00 p.m.

Wednesday, October 18

Keynote Address - Frans Johansson, Author of The Medici Effect<br>Future Lies at the Intersection: Best Place to Innovate<br>Session Code: CONVK3
Room Riverview Ballroom Session Time: 8:15 a.m.

Wednesday, October 18

Total Vehicle Panel
Session Code: TV
Room Riverview Ballroom Session Time: 1:00 p.m.

For the past 30 years, Convergence has focused on the blending of electronics within the mechanical system, the automobile. Electronics and software are having a more and more pronounced position of importance on the vehicle. By 2010, 90% of the vehicle innovation will come from electronics and software will comprise 80% of this innovation. The value of electronics and software is expected to grow to 35-40% of the vehicle value by 2010 and as the shift to fuel cell engines occurs, it is expected to reach up to 50%.

Where do other industries draw their innovation? their value? As the systems on the vehicle is continually changing from the mechanical system to this sophisticated system of electronics and software on wheels, what are the implications to the business? to the technology? to the product development cycles? to the business model and overall economics of the industry?

Within the last 10 years, the world has become smaller with more companies are reaching across global boundaries to answer some of these questions. But this may not be enough. As we proceed to 2010, automotive companies are beginning to reach across industry lines for the sharing and learning of best practices that can be applied to these questions. The Electronics and Aerospace & Defense Industry Verticals are providing unique opportunities for this cross pollination and more and more leaders within the Automotive Industry are making this connection and networking with their peers within these industries to capture lessons learned and application strategies. Each industry provides interesting but very different perspectives that have applicable adaptations within the automotive business. This certainly is not single sided sharing but bi-directional sharing, providing a new meaning to convergence.

Within the Total Vehicle Panel, industry leaders from the Automotive, Electronics and Aerospace & Defense industries will explore the convergence of business and technology, the convergence of globally boundary crashing, the convergence of best practices, and ultimately the convergence between industries.

Organizers - Meg A. Selfe, Industrial Sector Director, IBM Corp.
Panelists - Paul A. Camuti, President and CEO, Siemens Corporate Research, Inc.; Maryann L. Combs, Executive Director, Controls & Software, General Motors Corp.; Chris Cook, General Manager, AAMP of America and CEA Connectivity Chair; Peter S. Pao, Vice President Corporate Technology, Lead of Executive Technology, Raytheon Co.; David D. Robinson, President, Body Electrical, Electronics Division, Robert Bosch Corp.

Wednesday, October 18

Innovative Vehicle Design (part 2 of 2)
Session Code: VII/V2V DEMO
Room TBD Session Time: 9:00 a.m.
Convergence 2006 features a new and exciting project for youth, designed to stimulate innovative thinking through design and engineering. The Innovative Vehicle Design program unites high school teams with corporate partners around the design and building of a one-person, electric vehicle. Built as an innovation, not racing competition challenge, the IVD program allows each team a 10 month build window where students assume the leadership for all portions of the planning and development. Corporate support includes professional coaching from 2 to 4 engineers and a $5,000 financial contribution that is matched by the CEF board of directors. The $10,000 budget per team must be spent using 90% of the funds for the car, and 10% to be used for an Engineering Ambassador-ship where high school students influence middle-school students in their districts.