SAE 2011 Intelligent Vehicle Systems Symposium
Advancing the Connected Mobility Experience

November 8-9, 2011
Troy, Michigan, USA

Event Guide
Includes Final Program

www.sae.org/ivs
Vehicle communications provide endless opportunities for safer driving. From vehicle-to-vehicle communications (V2V) for improving the effectiveness of such advanced safety technologies as collision avoidance...or applications like intelligent speed adaption and intersection collision avoidance countermeasure systems, a transportation network featuring connectivity among vehicles, the infrastructure (V2I), and portable devices can only help to maximize automotive and public safety.

To assist in achieving connectivity, the automotive industry can look to SAE International for advancing vehicle communications technologies.

Providing a neutral forum for the development of needed engineering guidelines, the collective wisdom and thought leadership of the volunteers on its standards development committees can help industry advance these technologies, increase productivity, and reduce costs. With a 106-year history steeped in functional safety standards, SAE stands ready to tackle the complex advanced safety issues of today. Offering one of the largest libraries of intellectual property focused on mobility technology, the past and current work of the global engineering community can be referenced for designing, developing, and implementing the next generation of safety systems to save lives, prevent injuries, and reduce economic costs due to road traffic crashes.

For more on Vehicle Communications and all SAE Advanced Safety Standards & Resources, including information on Collision Avoidance/Mitigation and Driver Vehicle Interface, visit sae.org/standardsdev/safety/.
This symposium will address the entire electronic infrastructure that is connecting the HEV, EV and ICE vehicle to its environment. The focus will be on the application of vehicle electronics technology as applied to safety, ITS applications, the mobility internet, power system architectures as well as security issues related to vehicle electronic systems. Lastly, the symposium will address both system and component level architecture.

**EVENT AT-A-GLANCE**

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Event-at-a-Glance
Sponsored by **HCL**
Hours of Operation

Registration
Monday, November 7, 2011
4:00 - 6:00 p.m.
Tuesday, November 8, 2011
7:00 a.m. - 5:00 p.m.
Wednesday, November 9, 2011
7:30 a.m. - 12:00 p.m.

Onsite Registration
Categories and Fees
SAE Classic Member  $895
SAE Premium Member  $870
SAE Elite Member   $845
Non-Member       $1295
Participant (includes moderator, organizer, panelist, or presenter) FREE
Exhibitor Booth Personnel
(Limit 1 per booth) Exhibitor ID# required FREE
Registration Package includes Exhibit, Lunch, Refreshment Breaks, Networking Reception, Technical Sessions and Breakout sessions, copies of the presentations, access to the Electronic Systems for Vehicle Propulsion Symposium.

Technical Sessions
Tuesday, November 8
Dennison Junior Ballroom
8:00 a.m. – 5:30 p.m.
Wednesday, November 9
Dennison Junior Ballroom
8:00 a.m. – 5:30 p.m.

Exhibit
Visit the exhibits located in Salon D, E, F, G, H during breaks, lunches and networking reception.

Restaurants and Lounges
200 west, Troy Marriott
Casual American bistro featuring braised short ribs, pan-Asian cowboy steak, sweet potato fries, salmon club sandwich plus homemade ice creams and soups. Choose either crab cake sliders or short rib sliders. Standard breakfast and lunch menu.
  •  Open for breakfast, lunch and dinner
  •  Dress code: Casual

Local attractions and Things to do in the area
  •  Somerset Collection (Mall)
  •  Palace of Auburn Hills
  •  Great Lakes Crossing Outlet Mall
  •  DTE Energy Music Theater
  •  Cranbrook Museum
  •  Comerica Park (Detroit Tigers)
  •  Detroit Zoo
  •  Oakland Mall
  •  Ford Field
  •  Joe Louis Arena (Red Wings Hockey)

Speaker Ready Room
Board Room
Tuesday, November 8
7:00 a.m. – 3:00 p.m.
Wednesday, November 9
7:00 a.m. – 3:00 p.m.
Plenary Keynote - Safe, Green, Connected: The Future of Vehicles and the Mobile Internet

The global economy is still recovering from the crisis that occurred at the end of the past decade. Mature economies such as those of Western Europe and the U.S.A. are grappling with deficit and spending issues. As a result, the Western economic recovery is in the low single digit growth, whereas China is leading the BRIC (Brazil, Russia, India and China) with a much faster recovery close to the two-digit range. Though uneven, the global economic growth is exacerbating the demand of energy, thereby pushing the oil price above $100 per barrel. Recent climatic upheavals and the continuous melting of the Arctic ice are factual reminders of the global warming and call for a smaller global carbon footprint. Both macroeconomic trends and the global warming reality along with the quest for geopolitical stability are pushing the global automotive industry for better fuel economy. For the U.S. the current corporate average fuel economy (CAFÉ) of 27.5 mpg is expected to rise to 34.1 mpg by 2016 and perhaps 56 mpg by 2025.

In addition, the pervasiveness of the wireless communication technology is fostering a social need to stay permanently connected with others, including while driving. Thus, both demographic and social megatrends are introducing new challenges in increasing the number of high risk drivers and multiplying the sources of driving distraction. To cope with these new challenges, the car manufacturers and their suppliers are striving for higher safety capabilities on vehicles.

Overall, technological, economic, geopolitical, climatic, demographic, and social megatrends are posing new challenges requiring the vehicle of the future to be safer, greener, and connected.

This two-day symposium is gathering seasoned automotive experts along with reputable global policymakers and international experts from the aerospace, the defense, the telecommunication, the commercial vehicle industries. They will share their knowledge and vision for an intelligent vehicle endowed with:

- A new set of hardware and software units, along with specialized human machine interface (HMI) that unleashes an omnipresent connectivity based on radio, cellular and satellite communications along with emerging short range technology enabling navigation, infotainment, Internet access along with vehicle to vehicle and vehicle to infrastructure connectivity.
- New forms of data operations that are bringing new business opportunities and concerns such security, privacy and ownership.
- Convergence in passive and active safety.
- Additional capabilities combining active safety and connectivity that are paving the way for autonomous driving.

(continued on next page)
The advent of this ubiquitous connectivity is taking place in an ecosystem that is constantly evolving thanks to:

- New forms of businesses such as remote vehicle diagnostics or usage-based insurance,
- New policymaking in fuel economy and transportation safety,
- The progress of supporting technology such as cloud computing, dedicated short range communication (DSRC), and 4G long term evolution (LTE) with faster and higher capacity internetworking capabilities.
- This symposium will provide insightful perspectives to the new reality of the automotive industry: safe, green, and connected. Thus, it will project a vision on the Future of Vehicles and Intelligent Mobility.

Andrew Brown, Jr., PE, FESD, PhD, NAE
Andrew Brown, Jr., PE, FESD, PhD, NAE
Executive Director & Chief Technologist
Innovation & Technology Office
Delphi Corporation

As Executive Director & Chief Technologist, Dr. Brown provides leadership on corporate innovation and technology issues to help achieve profitable competitive advantage. He also represents Delphi globally in outside forums on matters of innovation and technology including government and regulatory agencies, customers, alliance partners, vendors, contracting agencies, academia, etc. Prior to this assignment, Dr. Brown had responsibility for common policies, practices, processes and performance across Delphi’s 17,000 member technical community globally and its budget of $2.0 billion, including establishing Delphi’s global engineering footprint with new centers in Poland, India, China, Mexico, etc.

He was elected as 2010 SAE International President and Chairman in November of 2009, and was sworn into office in January of 2010 for a one year term. He represented 125,000 members in over 100 countries.

As a NAE member, Dr. Brown was appointed by the National Research Council (NRC) to serve as chair of the Committee on Fuel Economy of Medium and Heavy Duty Vehicles. As part of the Energy Independence and Security Act of 2007, his 19 person committee composed of noted experts and consultants from industry, academia and government policy developed a report evaluating medium-duty and heavy-duty fuel economy standards. The report includes an assessment of technologies and costs for improving such vehicles. It was recently referenced by President Obama in his enhanced efforts on fuel economy improvement.

He currently serves or has served on the boards of the following organizations—Ford Design Institute, Society of Automotive Engineers Inc., Engineering Society of Detroit College of Fellows, Convergence Education Foundation, National Inventors Hall of Fame, Convergence Transportation Electronics Foundation, National Council of Engineering Examiners, State of Michigan Board of Professional Engineers, WSU College of Engineering Board of Advisors. Dr. Brown has been an adjunct professor at Wayne State University, University of Michigan, and Tsinghua University (Beijing, China). He is also the only Delphi member of the National Academy of Engineers and is also a member of the NRC Board on Energy and Environmental Systems and the SAE Foundation Board of Trustees (for complete bio visit: http://www.sae.org/events/training/symposia/ivs).
SPECIAL EVENTS

TUESDAY
November 8

Networking Refreshment Breaks w/Exhibit
Salon D, E, F, G, H
9:00 – 9:30 a.m.
3:35 – 4:00 p.m.

Networking Luncheon w/Exhibit
Salon D, E, F, G, H
12:00 – 1:30 p.m.

Joint Exhibit and Networking Reception
Salon D, E, F, G, H
5:30 - 7:00 p.m.
Day one concludes with an exhibition of leading companies in electronic technologies hosting a reception fall all attendees of this symposium. Take advantage of having all these leading edge companies in one place to address your electronic system issues and technology development questions. You also have the opportunity to network with your fellow attendees and speakers in a relax environment of drinks and appetizers.
Networking Refreshment Breaks w/Exhibit
Salon D, E, F, G, H
9:30 – 10:00 a.m.
3:35 – 3:50 p.m.

Networking Luncheon w/Exhibit
Salon D, E, F, G, H
12:00 – 1:30 p.m.
The focus of day one will be on active and passive safety and autonomous ground vehicle systems and their application and conclude with a panel discussion data security. The day begins with a plenary keynote by a leading expert on the future of vehicles and intelligent mobility. Throughout the rest of the morning speakers will address “Active” and “Tertiary” systems being introduced into vehicle fleets and all the technology and issues involved in making these systems work. The afternoon kicks off with speakers addressing unmanned ground vehicles (UGVs) and all the complexity involved with development of their systems. The technical portion of the day concludes with an expert panel discussion regarding concerns of privacy and ownership of your vehicle electronic system’s data.

Day one concludes with an exhibition of leading companies in electronic technologies hosting a reception fall all attendees of this symposium.

Organizers - Sukhbir Bilkhu, Chrysler Group LLC; Jean J. M. Botti, EADS Deutschland GmbH; Alex Kade, TARDEC; Scott Jerome McCormick, Connected Vehicle TA; Massimo Osella, GM R&D Center; Heri Rakouth, Delphi Corp.; Mark Zachos, DG Technologies

8:00 a.m.  
**Plenary Keynote - Safe, Green, Connected: The Future of Vehicles and the Mobile Internet**  
Andrew Brown, Jr., PE, FESD, PhD, NAE, Delphi Corporation  
9:00 a.m.  
**Networking Refreshment Break w/Exhibit**

**Convergence of Active and Passive Safety Systems to Create Intelligent Vehicles**

The Vehicle Safety can be Divided into Three Broad Areas: “Active”, “Passive” and “Tertiary” Safety. Until now the primary focus for the safety specialist in the Automobile Industry has been on passive safety. With the increasing miniaturization of high speed computing components, the increased use of computing in vehicle systems and communication “Active” and “Tertiary” systems are being introduced into the vehicle fleet at an increasing rate. ABS, ESC and post-crash notification are becoming common features in the next generation of vehicles. The speakers in this session will discuss the many current development paths that are being considered/ followed to introduce the connectivity to enhance vehicle safety and the potential pitfalls.

Organizer - Sukhi Bilkhu, Chrysler Group LLC  
9:30 a.m.  
**Vehicle Safety Systems: Past Present and Future**  
Priya Prasad, Prasadengg  
9:55 a.m.  
**Advanced Technologies: Its Promises and Possibilities in Total Safety**  
Joseph Kanianthra, NHTSA (retired)  
10:20 a.m.  
**Virtual Technology and Test Procedures for Connected Vehicles**  
Tony Bromwell, TASS Americas  
10:45 a.m.  
**Connected Vehicles Development Directions**  
Raymond J. Resendes, US Dept. of Transportation
11:10 a.m.  
**Panel Discussion: Potential Pitfalls of Connectivity**  
**Moderators** - Sukhi Bilkhu, Chrysler Group LLC  
**Panelists** - Joseph Kaniathan, NHTSA (retired); Priya Prasad, Prasadengg; Raymond J. Resendes, US Dept. of Transportation; Tom Schaffnit, CAMP; James Vondale, Ford Motor Co.

12:00 p.m.  
**Networking Luncheon w/Exhibit**

### Autonomous Ground Vehicles Applications and Systems
Autonomous ground vehicles will provide great economic and social benefits in the areas of improved vehicle safety, efficient, less stressful traffic flow, and better fuel efficiency. For the military, connected autonomous vehicles and systems can provide unmatched force effectiveness and efficiency while reducing unnecessary risk to the soldier, and the concept of optionally-manned vehicles is also changing the strategic direction of robotic vehicles in the military. These initiatives will reduce costs and increase innovation for both government and industry, and contribute to the re-invigoration of the U.S. economy.

**Organizer** - Alex Kade, US Army TARDEC

1:00 p.m.  
**Design and Development of Optionally-Manned Ground Robotic Systems: Autonomous Mobility Appliqué System**  
**Bernard Theisen**, US Army TARDEC

1:55 p.m.  
**Building a Marketplace for Intelligent and Autonomous Vehicles**  
**Daniel Bartz**, Booz Allen Hamilton Inc.

2:20 p.m.  
**Connected Autonomous Driving and EN-V Update**  
**Priyantha Mudalige**, GM Technical Center

2:45 p.m.  
**Issues in Transitioning from Driver-in-the-Loop to Driverless/Autonomous Vehicles**  
**Hemant Sardar**, Univ. of Michigan-Ann Arbor

3:10 p.m.  
**Future of Autonomous Vehicles**  
**Christian Schumacher**, Continental Automotive Systems NA

3:35 p.m.  
**Networking Refreshment Break w/Exhibit**

4:00 p.m.  
**Expert Panel Discussion: “Concerns of Privacy Issue and Ownership” and “Acquiring Data from Vehicle Electronic Systems”**  
Vehicle drivers or their owners may not always be aware of their vehicle's data reporting capabilities. Concerns about the implications of recording and the use or ownership of the vehicle data have not yet been fully resolved. This Session will explore Concerns of Privacy Issues and Ownership of any Acquired Data from Vehicle Electronic Systems.

**Moderators** - Linda Senigaglia, Navigation Solutions  
**Panelists** - David Dastvar, InnoVest Group; Joel A. Hoffmann, Intel Corp; Paul Laurenza, Dykema Gossett PLLC; Christian H. Slesak, Delphi Automotive Systems; Dorothy Ziegelbauer, Verisk Analytics, Inc.

4:30 p.m.  
**Expert Panel Discussion: Q&A Session**

5:30 p.m.  
**Joint Exhibit and Networking Reception**
Day two begins with technology transfer from other mobility industries. Learn from those outside the automotive industry on intelligent vehicle systems being developed in aircraft, military and commercial vehicles. The rest of the morning is dedicated a panel discussion on Hardware/Software Applications for Vehicle Connectivity. The afternoon is blend of speaker presentations and a panel discussion. Presentations will be focused on enabling technologies in vehicle electronics for the connected vehicles. The panel will provide a cross-industry perspective on the evolution of the intelligent vehicle ecosystem. Use this unique opportunity to ask questions and hear global perspectives from leaders of intelligent vehicle systems.

**Organizers** - Sukhbir Bilkhu, Chrysler Group LLC; Jean J. M. Botti, EADS Deutschland GmbH; Alex Kade, TARDEC; Scott Jerome McCormick, Connected Vehicle TA; Massimo Osella, GM R&D Center; Heri Rakouth, Delphi Corp.; Mark Zachos, DG Technologies

**Convergences in Connectivity from Other Mobility Electronics: Aerospace, Commercial Vehicle, or Military Mobility**

Do you ever wonder what intelligent systems electronics are being developed in aerospace, commercial vehicle or the military? Do you wonder if there are any that may have applicability to the automotive industry? This section of the symposium will showcase specific technology advances in these three industries and where there is opportunity for automotive application.

**Organizer** - Jean Botti, Denis Chapuis EADS

8:00 a.m.  
*Mobility Electronics in the Aerospace Industry*  
Denis Y. Chapuis, EADS

8:30 a.m.  
*Autonomous Convoys: Challenges in Technology*  
Jacob Fischer, Oshkosh Corporation

9:00 a.m.  
*Military Application*  
Mark Willhoft, BAE Systems

9:30 a.m.  
*Networking Refreshment Break w/Exhibits*

**Hardware/Software Applications for Vehicle Connectivity**

Major Tier 1 suppliers will present their views on hardware architectures and software applications for Vehicle Safety and Connectivity Integrity, Data Security, and Remote Vehicle Diagnostics.

**Organizer/Moderator** - Scott McCormick, Connected Vehicle Trade Association (CVTA)

10:00 a.m.  
*Vehicle 2 Vehicle Application Value Chain*  
Gary Streelman, Magneti Marelli

10:15 a.m.  
*Safety and Security - Is There an App for That?*  
Russell Hsing, Telcordia Technologies

10:30 a.m.  
*Using Telematics and Mechatronics to Improve Range and Emission*  
Chris Domin, Ricardo Inc.

10:45 a.m.  
*Connected Car/Connected Consumer: Safely Navigating the Digital Road Ahead*  
Timothy Johnson, Sprint

11:00 a.m.  
*Connecting with Safety: Using and Securing Data on the Road*  
Ryan Middleton, Delphi Corp.
11:15 a.m.  
**Panel Discussion: Question and Answer Session**  
Moderators - Scott Jerome McCormick, Connected Vehicle TA  
Panelists - Chris Domin, Ricardo Inc.; Timothy Johnson, Sprint; Ryan Middleton, Delphi Corp.; Gary Streelman, Magneti Marelli; Russell Hsing, Telcordia Technologies  

12:00 p.m.  
**Networking Luncheon w/Exhibit**  

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**Enabling Technologies in Vehicle Electronics for the Connected Vehicles**  
Wireless vehicular communications has been identified as a key technology for increasing road safety and transport efficiency, and providing Internet access on the move to ensure wireless ubiquitous connectivity. The great potential of this technology has been acknowledged with the establishment of ambitious research programs on vehicular communication systems worldwide, such as the current InteractIVe and eCoMOVE projects within the European eSafety framework, various US programs derived from USDOT projects, and the Japanese Smartway and Advanced Safety Vehicle programs. Furthermore, vehicular communication and networking also present a very active field of standardization activities worldwide, like ISO TC204, IEEE (802.11p and 1609.x), and SAE J2735 in the US, ETSI TC ITS and CEN WG278 in Europe and ARIB T-75 in Japan, as well as field trials like the large-scale Safety Pilot in the US, simTD in Germany and SCORE-F in France. This session aims to review technical and research aspects of the Enabling Technologies for vehicle connectivity (V2X: Vehicle-to-Vehicle, Vehicle-to-Infrastructure and Vehicle-to-Person).  

Organizer - Massimo (Max) Osella, General Motors Co.  

1:30 p.m.  
**Data Security and Privacy in Vehicle-to-Vehicle Communication**  
André Weimerskirch, Escrypt GmbH  

1:55 p.m.  
**Properties of the Vehicle-to-Vehicle DSRC Channel, and Equalization Strategies to Optimize the Performance of 802.11p**  
Dan Stancil, North Carolina State Univ.  

2:20 p.m.  
**OSGi technology, such as Mobile Devices, Smart Home, Automotive Telematics, M2M and Industrial Applications**  
Kai Hackbarth, Prosyst Software AG  

2:45 p.m.  
**Advances in Telematics**  
Giuseppe Faranda Cordella, Magneti Marelli S.p.A.  

3:00 p.m.  
**New Perspectives for Mass-Market ADAS**  
Vincent Abadie, PSA Peugeot Citroen  

3:35 p.m.  
**Networking Refreshment Break w/Exhibits**  

3:50 p.m.  
**Expert Panel Discussion: Ecosystem Evolution**  
This panel discussion will explore cross-industries perspectives on the evolution of the Intelligent Vehicle Ecosystem over the next decade in aftermarket, telecommunication, USDOT and service providers.  

Moderators - Heri Rakouth, Delphi Corp.  
Panelists - Walton L. Fehr, US Dept. of Transportation; Partha P. Goswami, General Motors LLC; Mika Rytikönen, Nokia Communications; Surya Prakash Tenneti, Verizon Wireless; John Waraniak, SEMA
Vehicle Safety Systems: Past Present and Future

Priya Prasad
Priya Prasad
Prasadengg

Dr. Priya Prasad retired from Ford after 35 years in Automotive Safety. For the last 14 years at Ford, he was a Technical Fellow in Safety conducting and directing safety research and advanced engineering in both Active and Passive Safety. He has written over 110 Technical Papers in Journals and Engineering Conferences. He is a member of the National Academy of Engineering, Fellow Member of the SAE and the AIMBE. He received several awards recognizing my contributions to the field of safety and biomechanics. Dr. Prasad was the first recipient of the National Award for the Advancement of Motor Vehicle Research and Development and have also received the NHTSA Excellence in Safety Award.

Notes
**Advanced Technologies: Its Promises and Possibilities in Total Safety**

**Abstract**

Significant progress has been made in the last four decades in reducing fatalities and injuries in motor vehicle crashes in the United States. As a result, the latest statistics show that the current casualties are at their lowest levels ever achieved. However, the underlying reasons for these reductions are not solely due to the enhancement of safety countermeasures in vehicles but also due to other reasons such as the down turn in economy and other factors. Therefore, this trend may not be sustainable once the economy improves and normal driving habits and vehicle use are resumed.

Past efforts in safety improvement were based on the premise that crashes are inevitable and therefore, the focus has to be mainly on occupant protection and injury mitigation. Advances made in electronics, sensors, vision systems, computational power and the like make it possible for adopting a new safety strategy whereby safety improvements can be made in every phase of a crash occurrence, namely, long before a crash, a crash imminent situation, during the crash event and even after the crash. This approach of addressing the safety need in every phase of the crash “continuum” afford us the opportunity to achieve “total” safety by judicious use of technologies for the purpose. Thus driving behavior, driving capability, driving performance, injury prevention and injury mitigation, as well as post-crash safety could all be improved.

Many such advanced vehicle technologies are slowly becoming available today to warn drivers of crash imminent situations and assist them in taking corrective actions. Technologies that could help to reduce crash severity and minimize potential severity of injuries when crashes are unavoidable are now coming in to the fleet. In the post-crash phase, vehicles can automatically call emergency services to quickly provide the necessary medical attention. Advanced occupant protection technologies could improve air bag deployment performance characteristics. New and innovative approaches to enhanced safety belt performance, seats, and other vehicle components performance are candidates that could be part of an integrated approach to improve safety. Such technological approaches and their deployment strategies will be discussed in this presentation.
Tony Bromwell has over 20 years of experience in the field of engineering design, testing, software development and project management. Since graduating from The University of Michigan – College of Engineering, Mr. Bromwell has worked in a variety of industries for both commercial and governmental clientele. Mr. Bromwell is the Managing Director for TASS Americas, the North American representative of TASS BV, a Dutch software development company focused on enhancing human safety through technology. TASS is most widely known for MADYMO the world’s most widely used software for passive safety development and more recently PreScan for Active Safety development. Along with its partners TNO and TTAI, TASS brings to the market one of the most comprehensive solutions for Intelligent Vehicle Systems and Advanced Safety Systems.

Abstract

Innovation in methodology and integration of different tools is needed to allow effective assessment of active safety systems. With the growing importance of active systems, an assessment methodology and complying development tools for active safety systems have the primary attention of both the developers and the regulators. Evaluation of active safety systems is complex and robust; repeatability and safety are key requirements in the assessment methods. The system performance of active safety systems depends on different factors such as the traffic environment, the vehicle state, and the driver behavior, that interact on different levels with each other. Complexity in scenarios makes it difficult to determine robustness, fail safety and overall system performance. Another challenge is the fact that more and more active safety systems operate in the zero time-to-collision (TTC) range, and with that, the need increases for new safe and non-destructive assessment methods. This presentation will describe a methodology for design and assessment of active safety systems. The method is based on seamless integration of simulation tools and test facilities, in order to allow an effective and efficient active safety system development process.

Connected Vehicles Development Directions

Raymond J. Resendes
US Dept. of Transportation

Biography not available
Panel Discussion: Potential Pitfalls of Connectivity

Moderator
Sukhi Bilkhu
Chrysler Group LLC
(See page 31 for biography)

Panelists
Joseph Kanianthra
NHTSA (retired)
(see page 13 for biography)

Priya Prasad
Prasadengg
(see page 12 for biography)

Raymond J. Resendes
US Dept. of Transportation
Biography not available

Tom Schaffnit
CAMP

Tom is an internationally-recognized expert in wireless telecommunications technology. He serves as the principal investigator for the V2V-Interoperability Project – under a cooperative pre-competitive research program between the Crash Avoidance Metrics Partnership - Vehicle Safety Communications III Consortium (a consortium of eight major automobile manufacturers) and the USDOT. His current responsibilities at Honda R&D Americas, Inc. are in the area of advanced safety systems enabled by wireless communications. In addition, he serves as president of the VII Consortium - a consortium of nine major automobile manufacturers - which is presently focused on policy questions relating to 5.9 GHz DSRC deployment. Tom has over twenty years of widely-ranging experience in wireless technologies - from developing technical standards to bringing new wireless services to market. Tom has an engineering education and background, complemented by an MBA degree and senior management experience.

James Vondale
Ford Motor Co.

Mr. Vondale joined Ford Motor Company’s Office of the General Counsel in 1981 where he handled complex product litigation matters, with an emphasis on vehicle restraints, including air bags and safety belts. From January, 2001, to July, 2011, Mr. Vondale was the Director of Ford’s Automotive Safety Office where he had global responsibility for a broad range of safety-related issues including safety strategy, regulatory forecasting, vehicle program support and internal and external safety investigations. Mr. Vondale has led Ford’s connected vehicle safety efforts and currently represents the vehicle industry on the ITS Advisory Committee.
**Design and Development ofOptionally-Manned Ground Robotic Systems: Autonomous Mobility Appliqué System**

**Abstract**

The Autonomous Mobility Appliqué System (AMAS) is intended to surmount the challenges of the current robotic solutions, which are proprietary and expensive, require extensive calibration, are specific to vehicle and application, and lack interoperability. The AMAS Joint Capability Technology Demonstration (JCTD) project is working to provide an “add on” kit, comprised of an Autonomy Kit and a By-wire Kit, to enable manned vehicles to be operated with unmanned capabilities. The Autonomy Kit includes the hardware box with the processing and decision-making, payload control functions, external communication, and sensors. The By-wire Kit includes platform specific cables, hardware, actuators, sensors and additional software as necessary to interface between the Autonomy Kit and mission payload and the host platform's environment. Technical demonstrations are planned for different levels of autonomy: Remote Control (RC), Driver Assist/Active Safety, and Semi-Autonomous Leader/Follower. These are intended to show refined scalable autonomy in a single material solution agnostic of platform, with a common Autonomy Kit, and a By-wire Kit that is vehicle specific but presents common interfaces and common framework. Such scalability and flexibility will address multiple tasks such as convoys, security, reconnaissance, sustainment, maneuver, and maneuver support.

**Bernard Theisen**
US Army TARDEC

Mr. Theisen graduated with his MS in Mechanical Engineering from Oakland University and began work at TARDEC’s Advance Vehicle Technologies (AVT) area at the Detroit Arsenal in Warren, MI where he began work on TARDEC’s S&T planning for future technology development. He then transitioned to Vecronics area to work directly on robotics system as part of the Robotic Follower (RF) Army Technology Objective (ATO) Advanced Concept Demonstrator (ACD). After rotations at the Joint Robotics Program (JRP) at the Pentagon and RDECOM System of Systems Integrator (SOSI) at Fort Belvoir. Mr. Theisen then returned to the newly formed Intelligent Ground System and ran the Remote Imaging for Unmanned Ground Vehicle (RIUGV) Project for TARDEC and the National Geospatial Intelligence Agency (NGA). He then transitioned to the Joint Center for Robotics (JCR) were he was the project manager for outreach responsible for engaging the community and industry to help foster the next generation of robotist. He is now part of TARDEC’s Ground Vehicle Robotics (GVR) area in his current position as Technical Manager (TM) for Autonomous Mobility Appliqué System (AMAS) Joint Capability Technology Demonstration (JCTD) and its transition to the Robot Systems Joint Project Office (RS JPO).

**Daniel Bartz**
Booz Allen Hamilton Inc.

Dan received his Bachelor's of Science in Mechanical and Electrical Engineering from Kettering University in 2002 and Master's Degree in Robotics from Carnegie Mellon in 2006. He participated in the 2005 DARPA Grand Challenge and the 2007 DARPA Urban Challenge what he worked on various vehicle dynamics and planning problems.

Mr. Bartz has also worked the area of Automotive Active Safety and Vehicle Sensors Technology at both the General Motors Research Labs and the Ford Motor company. Dan works for Booz Allen Hamilton, supporting Dr. Jim Overholt and Ground Vehicle Robotics at US Army TARDEC, where he tracks international trends in robotics and automotive technologies and helps his client form technology and business strategies.
Abstract

Connected Autonomous Driving (CAD) is an innovative and essential component of future Intelligent Transportation System. We envision future automobiles that drive themselves and handle the vast majority of the driving tasks by communicating with one another, infrastructure, and pedestrians; enhancing safety, reducing energy consumption and emissions. Preliminary research conducted in the General Motors R&D under Electric Network Vehicle (EN-V) program is an important first step towards paving the way to realize this future driving paradigm.

This presentation describes CAD in general, and how it differs from conventional autonomous driving approaches. An update of the current EN-V vehicles including communication standards, architecture, positioning system, vehicle interfaces and motion control algorithms will be discussed in detail. Infrastructure and vehicle requirements to enable higher speed autonomous vehicles operation for naturalistic driving environments will also be discussed with the hope that our current research efforts will nurture further research activities in this area.

Issues in Transitioning from Driver-in-the-Loop to Driverless/Autonomous Vehicles

Abstract

Autonomous systems have been evolving at a rapid rate with support from the defense department. Most current UGVs have their developmental roots in the DARPA challenges, and are characterized by complex sensors systems coupled with substantial computing capabilities. These include GPS, lidar, vision and other sensors for vehicle states. These sensor suites usually include 360-degree sensing capability in the horizontal plane plus some capability for sensing in the vertical plane (elevation) to ensure potential obstacles of different heights are captured. Additionally, maneuverability is limited to medium-to-low speeds to ensure vehicle stability. However, in the context of the civilian automotive environment, these solutions are not seen as directly applicable for a variety of reasons.
Future of Autonomous Vehicles

Christian Schumacher
Continental Automotive Systems NA

Christian Schumacher is the Head of Systems & Technology for Continental Automotive Systems N.A., a position he has held since January 1st, 2010. In this capacity, Schumacher is responsible for all activities in North American Region for this central function. Prior to this position, Schumacher was Engineering Manager, Advanced Driver Assistance Systems and Contiguard (the Active Passive integration Approach) for Continental Automotive Systems N.A. In this capacity, Schumacher was responsible for engineering of the North American Region for these product areas.

In 2005 and 2006 he managed software engineering supporting all core Electronic Brake Systems (EBS) software activities in North America.

Between 2002 and 2005 Schumacher was responsible for EBS software algorithm development supporting all North American Ford applications including the introduction of Electronic Stability Control (ESC) and Roll Over Stability Control (RSC) with Ford.

He began his career with ITT Automotive Brake Systems (Alfred Teves, Frankfurt, Germany) in 1997 in Control Strategy Engineering involved in the development of Traction Control Systems and ESC and moved to the United States in 1999 to adapt and introduce the core Continental ESC to the American market.

Schumacher earned a Master Degree in Electrical Engineering from Technical University Darmstadt (Germany) in 1997.

He currently lives in Lake Orion, Michigan with his wife and three children.

Abstract

Driver assistance features like lane departure warning or adaptive cruise control have been introduced to the market focusing on basic, independent scenarios. The trend is showing that these kinds of products are facing more and more complex scenarios and we are transitioning from single independent functions to a strongly networked system. Some of the drivers for future autonomous vehicles are 360° monitoring by active safety technology and V2X (vehicle to vehicle or vehicle to infrastructure) communication.

In the past vehicles were strictly operated by the driver. Advanced driver assistance products added so called feedback features like lane departure warning. First steps towards semi-autonomous driving started with the development of active support functions like adaptive cruise control or lane keeping support.

Collision mitigation with various authority levels is the next milestone towards automation followed by other, even more advanced, features.

Over the next several years the industry will see a transition from driver only operations and assisted driving to semi-autonomous and highly automated driving up to potentially full automation.

Key for the introduction of these kinds of systems will be to address the technical, architectural, driver acceptance and legal challenges.
TUESDAY
November 8

Expert Panel Discussion: “Concerns of Privacy Issue and Ownership” and “Acquiring Data from Vehicle Electronic Systems”

Vehicle drivers or their owners may not always be aware of their vehicle’s data reporting capabilities. Concerns about the implications of recording and the use or ownership of the vehicle data have not yet been fully resolved. This Session will explore Concerns of Privacy Issues and Ownership of any Acquired Data from Vehicle Electronic Systems.

Moderator

Linda Senigaglia
Navigation Solutions

Linda Senigaglia brings a fresh perspective to the complexities of location based services and telematics. She is an accomplished executive with expertise from serving in key business development, product marketing, product management, and sales positions with leading companies in the ecosystem and value chain, such as Nokia, Magellan, TeleNav, iGo™ My Way, and Navigation Solutions. At Navigation Solutions, Linda utilizes her understanding of location based services, telematics, consumer electronics, and competitive market intelligence to develop strategic business partnerships, and create and execute successful growth strategies for Hertz and non Hertz business.

Panelists

David Dastvar
InnoVest Group

Biography not available

Paul Laurenza
Dykema Gossett PLLC

Paul Laurenza, Managing Member of Dykema’s Washington, D.C. office, represents automotive and other clients on federal regulatory and related litigation issues, including those before the Department of Transportation, Federal Trade Commission, U.S. Consumer Product Safety Commission, and U.S. Customs and Border Protection. Mr. Laurenza has published and spoken extensively on motor vehicle-related issues, including regulatory and liability issues involving connected vehicles. He also serves on the Board of Directors of the Connected Vehicle Trade Association.

Joel A. Hoffmann
Strategic Market Development Manage
In-Vehicle Infotainment, LEPD-IVI
Intel Corp.

Biography not available

continued on next page
Expert Panel Discussion: “Concerns of Privacy Issue and Ownership” and “Acquiring Data from Vehicle Electronic Systems” (continued)

**Dorothy Ziegelbauer**
Verisk Analytics, Inc.

Dorothy Ziegelbauer is a Product development and Project manager for Verisk Analytic's Applied Informatix Unit. Dorothy has been working closely with customers and strategic partners on product development initiatives and insurance underwriting applications for almost 10 years. More recently her focus has been working on telematics product development activities and expanding her knowledge and expertise of telematics data and its relevant use in the insurance industry.

Dorothy holds a Bachelor’s Degree in Information Systems from Ramapo College of New Jersey, a Masters Degree in Information Systems, and a Project Management Certificate from Stevens Institute of Technology.

**Christian H. Slesak**
Delphi Automotive Systems

Biography not available

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Mobility Electronics in the Aerospace Industry

Denis Y. Chapuis
EADS

Denis Chapuis, 54 yo, joined the French Naval Academy in 1975 and the French Submarine Force in 1979. He specialized in Submarine Launched Ballistic Missiles and executed five operational deployments and one post overhaul sea trial period. He then came back to the command line and had three command tours, one Diesel Attack Submarine, one SSN (Fast-Attack, nuclear powered submarine) and one SSBN (Nuclear powered, ballistic missiles launcher submarine). He has also been Project Officer of the new class of fast attack submarines being presently built for the French Navy, and of the M51 ballistic missile, currently deployed. In 1993, he graduated from the US Naval War College in Newport, Rhode Island, as an exchange student. He left the French Navy in 2000 to join PSA Peugeot Citroën as a senior research manager, in charge of Chassis Systems and associated electronics for three years, then in charge of Hybrid Vehicles & alternative propulsion, Electric and Electronic Architecture as well as systems integration, for another three years. He then spent one year as the Engines & Gearboxes Product Planner for PSA worldwide, before joining EADS. Since February 2007, he acts as a Research & Technology Coordinator for the whole EADS Group, in charge of Electronics, Sensors, Signal processing and System Integration.

Abstract
Under today customer and regulatory pressures, Automotive and Aerospace industries are both striving for the same challenges, increased safety, lower costs and lower fuel consumption. Even if these industries are quite different, addressing a very broad panel of applications and customers, they have a lot more in common than they think and their requirements are converging. The presentation will discuss this convergence and propose a number of areas where increased cooperation could be most beneficial for all.

Autonomous Convoys: Challenges in Technology

Jacob Fischer
Oshkosh Corporation

Jake Fischer holds a bachelors degree in electrical engineering from Michigan Tech. He has been a dedicated employee of Oshkosh Corporation for 10 years, working primarily in systems integration and electronic development. For the past 6 years he has focused entirely on unmanned ground vehicle development and is currently in full swing on development of Oshkosh’s fourth generation unmanned system under contract with the US Marine Corp. Jake is an avid roboticist at work, at home in his “spare” time and through his volunteer work through the FIRST Robotics STEM education program (www.waverobotics.com).

Abstract
In the past decade, one of the veritable holy grails of automotive systems has become achievable unmanned ground vehicles. There are obvious liability, public perception and infrastructure issues to overcome, but before those even become a major hurdle, technology, software and system designs will have to make giant strides. Sensors, computers, safety systems and software that were used only five years ago are all but obsolete now. The disparity between old and new technology only highlights how much further the industry needs to travel to become mature. Oshkosh Corporation has developed four generations of autonomous systems over the past eight years and is currently focused on applications in military autonomous convoys with the US Marine Corp. This presentation will underline the struggles and accomplishments with Oshkosh’s technology and software choices, what they know works and fails and what they believe needs to fill the gap to make autonomous convoys a reality.
Wedneday
November 9

Military Application

Mark Willhoft
BAE Systems

Biography not available

Vehicle 2 Vehicle Application Value Chain

Gary Streelman
Program Manager, Infotainment & Navigation and Telematics
Magneti Marelli

Mr. Streelman is working for Magneti Marelli Electronics in the roll of Program Manager for Infotainment & Navigation and Telematics in North America. He received his BS and MS degrees in Mechanical Engineering from the University of Michigan. Currently he is coordinating activity related to vehicle connectivity including fleet management and other Telematics applications in North America. In his career he has been active in following connectivity to and from the vehicle and has authored a number of papers. His career has involved designing and implementing electronic systems for automotive applications.

Abstract
The connected vehicle is becoming a reality and the expectation of the consumer to have applications in their vehicle is a very natural extension. The supply of apps for the smart phone and tablet markets clearly demonstrates there is interest from the app providers and demand from the consumer. How do we identify the value, to the consumer, to the OEM, to the app provider? And while this is evolving, knowing that some apps will provide added safety, and others could introduce distraction, where does the value chain lead.
Safety and Security - Is There an App for That?

Russell Hsing
Director R&D
Telcordia Technologies

Dr. T. Russell Hsing, a Fellow of the IEEE, British Computer Society (BCS) in UK, and the SPIE-The Internal Society for Optical Engineering. He is now an Executive Director to manage and lead the Emerging Technologies and Services Research Department at Telcordia Technologies. He is also supervising Directors for the Telcordia Applied Research Center in Poland (TARC-PL) and Taiwan (TARC-TW). He is a board member for CVTA (Connected Vehicles Trade Association). Dr. Hsing has accumulated 30+ years in the telecommunications and information & communications technology industry. He is an adjunct professor of the Electrical Engineering Department at the Arizona State University, a Member of the Scientific Advisory Board for the Institute of Networks Coding at the Chinese University of Hong Kong, and a guest professor at the Peking University in Beijing, China. He has been publishing extensively and is active member for the IEEE Communications Society (Comsoc). He is a Founding Chair of a Technical Sub-Committee on Vehicular Networks and Telematics Applications for the IEEE Comsoc. He has been a co-Editor-in-Chief of the ICT Book Series for the John Wiley & Sons Publications, Inc. since 2007. Dr. Hsing has pioneered the technology transfer and commercialization of Information and Communications Technology (ICT) for Bellcore (and then Telcordia Technologies).

Using Telematics and Mechatronics to Improve Range and Emission

Chris Domin
Ricardo Inc.

Chris Domin heads up the Intelligent and Autonomous Systems group at Ricardo’s Detroit Technology Campus, where he is building environmental, safety, and mission applications for automotive, commercial, and defense vehicles. His current work is focused on robust, cost-effective solutions for autonomous systems and connected vehicle technologies. A systems engineer in practice, he has developed embedded systems for diverse markets, including the financial industry, the military, aerospace, commercial vehicle, and automotive segments. He is a recognized expert in quality system practices and has lectured internationally.
Connected Car/Connected Consumer: Safely Navigating the Digital Road Ahead

Timothy Johnson
Emerging Solutions, Strategic Opportunities Manager
Sprint

Tim Johnson is Sprint Nextel’s Strategic Opportunity Manager for OEM Telematics solutions. Tim has been with Sprint Nextel since 2001 in various regional and national roles, maintaining a core interest on data-centric wireless mobile solutions which enhance both enterprise and end user value. Tim has been focusing exclusively on in-vehicle connectivity solutions since 2007 as a result of leading the Sprint collaboration with Ford Motor Company around Ford Work Solutions.

Connecting with Safety: Using and Securing Data on the Road

Ryan Middleton
Executive Director & Chief Technologist
Innovation & Technology Office
Delphi Corporation

Ryan Middleton is Software Project Lead, Forward Engineering at Delphi and has worked on advanced automotive infotainment features since 2008. Ryan’s developments include software architecture, HMI, and supplier sourcing for features such as application frameworks, Bluetooth, and connected navigation. Besides playing a key role in production systems, he has helped determine strategies and technical direction for emerging infotainment features. Ryan earned his B.S. in Computer Graphics Technology from Purdue University with a focus on Interactive Multimedia Design. His previous experience and continued interests in web application development and user interaction design influence his perspective on automotive trends.

Abstract
At the core of emerging connected vehicle trends are new data points to empower application developers, content providers, and consumers. OEM systems already use connectivity to provide traffic information, search engine results, active safety feedback, remote vehicle monitoring, and more. Soon standard platforms will open up this pipe to third party services. And though drivers may want to be connected 24/7, in reality this opens the door to new challenges. Some data comes from the cloud to the car, other data from the car to cloud – but all of it must be used safely and securely. Vehicle systems should follow guidelines and implement software architectures promoting safe policies and data security.
Data Security and Privacy in Vehicle-to-Vehicle Communication

André Weimerskirch
CEO
Escrypt GmbH

André Weimerskirch is co-founder of ESCRYPT and currently Chief Executive Officer (CEO) of American-based ESCRYPT Inc. He studied business information technology as well as mathematics at Darmstadt Technical University before receiving his Master of Science in computer science at Worcester Polytechnic Institute, USA. He then received a Ph.D. of Ruhr-University of Bochum in the area of applied data security. Since then Andre has been involved in numerous industry projects in the area of embedded data security and privacy, both in the US and Europe. He published numerous articles in academic and industrial workshops, and contributed to several industry standards around automotive data security. Andre’s areas of expertise include in-vehicle communication data security, physical security, automotive security applications, digital rights management, and theft protection. In the area of inter-vehicle communication, he participates in the IEEE 1609 standards working group and is an editor of the European ETSI TC ITS V2X security standard. Furthermore, Andre is member of the European Car-to-Car Communications Consortium, is the main security consultant of the VSC-A and VSC3 V2V safety application project, and supervises ESCRYPT’s IEEE 1609.2 security stack product.

Abstract
Vehicle-to-vehicle (V2V) communication is believed to increase traffic safety considerably. However, proper data security and privacy solutions are a main requirement before the system can be launched. A secure and privacy preserving V2V communication system needs to cover a variety of security aspects, including security of over-the-air messages, secure implementation of applications running in vehicles, physical security of the computing platform, and policy decisions regarding security and privacy. In this presentation, the problems will be described and approaches will be discussed. The problems will be considered from different perspectives, including standardization, car makers’ implementation, and regulation. Technical solutions are currently designed and implemented to be used in field operational tests. The presentation will conclude with remaining open issues.

Notes
WEDNESDAY
November 9

Properties of the Vehicle-to-Vehicle DSRC Channel, and Equalization Strategies to Optimize the Performance of 802.11p

Dan Stancil
North Carolina State University

Biography not available
OSGi Technology, such as Mobile Devices, Smart Home, Automotive Telematics, M2M and Industrial Applications

Kai Hackbarth
Prosyst Software AG

Mr. Hackbarth has been actively involved in the technical work of the OSGi Alliance for more than 10 years. He is the Chair of the OSGi Requirements Working Committee, Residential Expert Group as well as interim Chair of the Vehicle Expert Group. Mr. Hackbarth was involved in several government funded research projects, such as Global Systems for Telematics (GST) and Vehicle Infrastructure Integration (VII). In addition he promotes the OSGi-Technology in various other initiatives such as BITKOMs’ “Dialogkreis Telematik & Navigation”. He played key role in the foundation of the OSGi Users’-Forum Germany, where he serves as Chairman since September 2008. Mr. Hackbarth’s focus lies in the areas of smart-home and automotive telematics, where he actively drives current developments and is involved in the strategic positioning of ProSyst’s product.

Abstract

The OSGi Universal Middleware is the dynamic module system for Java. Its being used in many different environments, from various embedded systems to enterprise systems as well as for cloud computing. This presentation provider a general overview of the OSGi Universal Middleware and its benefits. Additionally it will provide an overview of successful deployments. The presentation will close with an overview of possible other platforms for IVS and their advantages and disadvantages in comparison to OSGi.

Advances in Telematics

Giuseppe Faranda Cordella
Magneti Marelli S.p.A.

Biography not available
New Perspectives for Mass-Market ADAS

Vincent Abadie
PSA Peugeot Citroën
Graduate of the École Centrale of Lille (French engineering school) in 1990 and holder of a PHD in control design delivered in 1994, he was from 2001 to 2006 in charge of the global chassis control innovation project. Since 2009, he is responsible of the technological strategy definition of controlled chassis and safety domain in the Research and Advanced Engineering Division. He is also the Expert Leader for PSA group for controlled chassis systems.

Abstract
An increasing number of ADAS is proposed on vehicles on most of automotive markets. This offer is pushed by the evolution of sensor technologies who allow to give new functions for driving assistance and vehicle safety.

Nevertheless, the deployment of ADAS remains still limited for economic and technical reasons. The high cost of the systems confines the applications on top of range vehicles what does not allow to introduce an economic virtuous circle connected to the increase of volumes. Moreover, some functions turn out finally of a reduced utility for the final customer and are gradually given up. Others are also received as complex to use which limits their acceptance by a part of the drivers. Besides, some ADAS requires some deep safety study and long validation phases on rolling prototypes due to their potential impact on the security behavior of the car.

In the last decade, the philosophy of PSA was to propose a deployment of systems with the objective of democratizing the use by making them available on a large range of vehicles. Therefore, the most cost affordable, effective and easiest to use functions were privileged. An illustration of that is the generalization of the speed regulation and limitation system to all the models of Peugeot and Citroën cars. Some other ADAS systems have also been deployed widely: Ultrasonic sensors for parking assistance functions, Lane Departure Warning System or Blind Spot Detection. These systems are based on economic sensors (MRR radars, US sensors) and their efficiency is more and more recognized by customers.

For years to come, the success of the deployment of ADAS will result from the capacity of the actors of automotive industry to reduce costs, to improve the effectiveness and simplicity of use of functions which will be proposed so that they become major for the customer and to master safety and reliability. For that purpose, several tasks are to be led in parallel: to continue the component cost reduction which has already been started by some suppliers and which has to become widespread to all the technologies; to start the component architecture simplification by the mutualization of the use of sensors and ECU for all the functions; to improve the human factor methods for function acceptance evaluation and to develop new methodologies for safety validation and qualification of ADAS based on a combined approach using rolling prototypes, interactive simulation and virtual reality.

Jean-François Boissou
PSA Peugeot Citroën
Graduate of the Ecole Supérieure d’optique (French engineering school) in 1985 and holder of a MBA delivered in 1995 by the IAE of Paris, he was from 2005 to 2009 in charge of ADAS innovation projects. Since 2009, he is in charge of studies in relation with Driver Assistance, Safety Systems and Lighting in the Research and Advanced Engineering Division.
WEDNESDAY
November 9
Expert Panel Discussion: Ecosystem Evolution

Moderator
Heri Rakouth
Delphi Corporation
(See page 33 for biography)

Panelists

Walton L. Fehr
US Dept. of Transportation

Walton Fehr is a member of the technical staff of the Intelligent Transportation Systems Joint Program within the US Department of Transportation. He is responsible for leading the Office’s research into the development of technology that enables connected vehicle safety, mobility, and environment improvement applications. Prior to joining the Department two years ago, Mr. Fehr spent over 25 years in the automotive electronics industry.

Mika Rytkönen
Nokia Communications

Mr. Mika Rytkönen currently holds the position of Director, Industry Collaboration, at the Nokia automotive, in Espoo, Finland. He has a M.Sc. in Computer Science from the University of Oulu, Oulu, Finland and an MBA in International Finance from the Helsinki School of Economics.

Mr. Rytkönen has a leading role in establishing the Car Connectivity Consortium (CCC), founded in February 2011, and is serving as the Consortium President and Board Chairman. Today, CCC has 31 members, which represent a 60% global market share in both the automotive and handset businesses. The CCC’s main focus is on further developing the MirrorLink™ specification. MirrorLink™ is the open industry standard for phone centric car connectivity.

Mr. Rytkönen has a wide-ranging industry experience, and has held several positions in Nokia during last 20 years. During this time he has worked as a software designer, team leader for logistics in a manufacturing unit, engineering manager for GPRS (General Packet Radio System) protocol software and has held several positions as Program Director.

Before joining Nokia’s automotive activities, Rytkönen had a leading role in the Nokia Trolltech M&A project.

He has also been a professional coach in Finnish baseball. His team won silver medal in the highest league in Finland at 1996. While not travelling, he enjoys golfing, reading and being a father for his four children.

Partha P. Goswami
General Motors LLC

Dr. Goswami has more than eighteen years of experience in the automotive industry. His diverse background includes automotive product development, concept innovation, technology and market strategy. He has been in his current role in General Motors Global R&D for the last five years. In this role, he manages the portfolio of GM’s advanced projects in Connected Vehicle & Infotainment (CVI) and is responsible for infotainment trend assessment, long-term technology strategy and roadmap development. He holds a Ph.D. in Aerospace/Engineering Mechanics from Iowa State University and an MBA from Ross School of Business, University of Michigan.

Surya Prakash Tenneti
Manager Product Dev/Mgmt
M2M & Telematics Marketing
Verizon Wireless

Biography not available
John Waraniak
Vice President of Vehicle Technology
Specialty Equipment Market Association (SEMA)

John Waraniak, vice president of vehicle technology leads SEMA's advanced vehicle technology strategy, programs and initiatives. His role is to help performance aftermarket companies understand the challenges, develop solutions and capitalize on new business opportunities presented by today's complex vehicle technologies and systems. Waraniak is a proven industry leader who has worked for automotive, motorsports, aerospace and consumer products companies for more than 25 years. With specific expertise in vehicle systems engineering and collaborative product development, Waraniak serves as the primary contact for SEMA members to reach automakers and original-equipment suppliers on vehicle architecture and systems integration issues.

John currently serves as a member of the Carroll A. Campbell Jr., Graduate Engineering Center Industrial Advisory Board at Clemson University and the Progressive Insurance Automotive X Prize Administration Advisory Board. Prior to joining SEMA, Waraniak held executive management positions with a range of global companies, including TATA Motors, Johnson Controls, General Motors, Hughes Aircraft, Northrop and No Fear. His visionary and entrepreneurial leadership skills played an integral role in helping these companies develop and implement innovative strategies for adapting best business and technology practices for lean product-process development, customer-centric growth and improved profitability.

Waraniak earned a bachelor's degree in mechanical engineering from the University of Michigan. He has a master's degree in mechanical and industrial engineering from the University of Illinois and a master's degree in engineering management from West Coast University. He also graduated from the California Institute of Technology's Executive Engineering Management Program.

John is an avid auto industry and motocross enthusiast. He resides in West Bloomfield, Michigan with his wife Terri and has two sons, Scott and Jeff.
**Event Organizers**

**Sukhbir Bilkhu**  
Executive Specialist, Experimental & Computational Mechanics  
Chrysler Group LLC  

Mr. Bilkhu is a vehicle safety specialist with over 24 years of experience in auto industry. He has been with Chrysler LLC over 19 years most recently as an Executive Specialist in Experimental & Computational Mechanics Department. Specifically he is a Passive Safety Expert and has been leading the development of safety guidelines used to design vehicle to meet regulatory and third party performance requirements. He represents Chrysler and the Alliance at many International safety meetings (WP29-GTR/GRSP, ISO/SC10). He has recently completed Design for Six Sigma (DFSS) Black Belt level certification.  

Mr. Bilkhu has an MS in Nuclear Science & Eng. and BS in Mechanical Engineering from the Imperial College London, UK.

**Dr. Jean Botti**  
Chief Technical Officer  
EADS  

Dr. Jean J. Botti, born on 14 April 1957, is Chief Technical Officer (CTO) of EADS and a member of the EADS Executive Committee. He has corporate responsibility for Technology, Quality and Information Technology. Prior to assuming this position in May 2006, Dr. Botti served as the business line executive for Powertrain and Executive Director Fuel Cells with Delphi Corporation. Dr. Botti began his career in 1978 at Renault and became Senior Project Engineer. He joined General Motors in the United States in 1989. In 1990, he became Staff Project Engineer at the Saginaw Steering Systems Division of General Motors. From 1992 until 1997, Botti returned to France as its Director of European Engineering and was then named Director Customer Solution Center, a position he continued to hold with the Delphi Corporation until 2002. From that year on until 2004, he managed the newly created corporate Dynamics, Propulsion and Thermal Innovation Center as the Chief Technologist. Dr. Botti graduated from I.N.S.A. Toulouse in 1986 with a master's degree in mechanical engineering. He also earned an MBA from Central Michigan University in 1991, and went on to earn a Ph.D. in mechanical engineering from the Conservatoire National des Arts et Métiers, Paris in 1995.

**Bernard Challen**  
Shoreham Services, Engineering Consultancy  

Bernard J. Challen is a Chartered Engineer in England. As former Technical Director with Ricardo Consulting Engineers in the U.K., he was responsible for developing noise, vibration and harshness (NVH), electronic controls activities, and for establishing Ricardo’s North American business operation in 1990. During his 21-year career with Ricardo, he also began the company's engine and vehicle noise and vibration reduction services, working with clients around the world. Challen is a Royal Academy of Engineering Visiting Professor in Principles of Engineering Design at the University of Sussex, England.  

A member of SAE International for more than 18 years, Challen has helped organize many conferences, chairing the Noise & Vibration Conference committee and organizing a Powertrain Electronic Controls session at the SAE World Congress. He also has co-authored more than a dozen SAE International technical papers and edited the second edition of the Diesel Engine Reference book. Elected an SAE Fellow in 1997, he also has received three SAE Forest McFarland Awards and the SAE 2008 Medal of Honor. Challen earned a bachelor’s in mechanical engineering from Southampton University and a master’s in noise and vibration from the Institute of Sound and Vibration Research.
Alex Kade, PE
Deputy Associate Director
US Army TARDEC

Mr. Kade has over 30 years of experience with a wide range of automotive electrical, chassis controls and active safety systems and components and has received several corporate and industry awards and over 30 US patents for his work in these areas. He is currently working for the US Army TARDEC as a Deputy Associate Director in the Ground Vehicle Robotics department. Prior to joining TARDEC, Mr. Kade served as a General Motors Senior Technical Fellow, with responsibilities for Chassis-Electrical Controls and Sensors, Electrical Power Systems, and for Active Safety and Object Detection Systems. He is a Michigan Professional Engineer and a graduate of Wayne State University, receiving his Bachelors and Masters Degrees in Electrical Engineering in 1974 and 1976, respectively.

Scott McCormick
President
Connected Vehicle Trade Association

Scott has degrees in Mechanical and Aerospace Engineering, a Masters in Business Administration, and Doctoral Research in Artificial Intelligence. Prior to being the President of the Connected Vehicle Trade Association, Scott was the Executive Director of the Automotive Multimedia Interface Collaboration, a nonprofit research organization of the world’s largest automakers. Prior to these positions, he was General Electric's Factory with a Future Program Manager for both Transportation and Aircraft Engine Business Divisions, implementing over $1 billion in advanced automation and systems.

Scott is a former Advisor to the United States National Science Foundation and the Industrial Sector Representative to the US Federal Laboratories Technology Transfer Consortium. He is the founder and Chairman of the US Federal Laboratories Technology Transfer Consortium. He is the founder and Chairman of the US Federal Laboratories Technology Transfer Consortium. He is the founder and Chairman of the US Federal Laboratories Technology Transfer Consortium. He is the founder and Chairman of the US Federal Laboratories Technology Transfer Consortium. He is the founder and Chairman of the US Federal Laboratories Technology Transfer Consortium. He is the founder and Chairman of the US Federal Laboratories Technology Transfer Consortium. Scott is a member of the US ISO Technical Advisory Group. He co-founded and Chairs the Global Telematics Forum with trade associations from Europe, Korea, Australia, Taiwan and China. He serves as a Member of the Steering Committee to the Joint Commercial-Military Intelligent Transportation Systems Summit and as Industry Representative for CVTA to the US Congressional ITS Caucus' Industry Advisory Board.

Massimo Osella
Manager, Electronic Control and Software Architectures and Vehicle Connectivity Group
General Motors R&D

Mr. Osella is the manager of Electronic Control and Software Architectures and Vehicle Connectivity group within the ECI Lab in General Motors R&D. His research areas are vehicle electronic systems architectures, network protocols, software architectures, safety and security, infotainment platforms and applications, wireless technologies and V2X communications. He received a master degree (laurea) in Electronic Engineering at Politecnico of Torino (Italy) in 1987.

He spent 19 years in FIAT Research Center in Torino (Italy) working at the Electronic Systems division where he was Group Manager of the Diagnosis & Safety group. He was responsible of the safety analysis of several production and research Fiat projects. He also worked on several European research projects on diagnosis, by-wire and system architecture topics; the last one was EASIS (Electronic Architecture and System Engineering for Integrated Safety Systems) where he led the Hardware Architecture work package.

In 2006 he joined GM R&D in Warren (Michigan, USA) as a Lab Group Manager. He is the Principal Investigator of the GM-CMU Vehicle Information Technology Collaborative Research Laboratory and the GM representative in the Carnegie Mellon CyLab.
**Dr. Heri Rakouth**  
Manager, Technology Exploration  
Innovation and Technology Office  
Dephi Corporation  

Dr. Heri Rakouth is currently Manager, Technology Exploration at the Innovation and Technology Office (ITO) of Delphi Troy, Michigan. In this capacity, he coordinates technology innovation activities across three out the five divisions of Delphi.

Dr. Rakouth has about 30 years’ experience in both aerospace/defense telecommunications and automotive electronics industries. He has held various responsibilities at Thomson CSF/Thales and Renault in France as an EMC expert and a technical manager before joining Delphi in 1996.

In his most recent assignment, Dr. Rakouth spearheaded Delphi cross-divisional efforts that have led to the build of the telematics business development team for the aftermarket and the launch of the V2X proof of concept project recently implemented for the Land Transport Authority of Singapore. While working for Renault in early 1990’s, Dr. Rakouth has contributed to the build the European directive in EMC 95/54/EC (now known as 2004/104/EC) in championing several test methods that are currently part the international standards ISO 11451, ISO 11452, and CISPR 25.

As an EMC expert for Thomson CSF, he spearheaded the EMC, Tempest, and EMP protections of the battlefield wireless communication system for the U.S. army known as Mobile Subscriber Equipment in late 1980’s.

**Mark Zachos**  
President  
Dearborn Group Technology, Inc.  

Mark P. Zachos is president of Dearborn Group Inc (DG). DG specializes in the design and development of intelligent software and hardware vehicle communications interface products for the mobility industry. Zachos founded the company in 1987 and his functions include data communications, wireless networks, software development, product testing, customer service, product development, project management, and business development.

Zachos joined SAE International in 1991 as a member of the SAE Detroit Section. He received the SAE Forest R. McFarland Award in 2002. In addition, he serves on the Electrical and Computer Engineering Advisory Board at the University of Michigan, Dearborn, where he also serves as an adjunct professor.

Zachos holds a bachelor’s in electrical engineering from the University of Michigan and a master’s in electrical engineering from the University of Detroit.
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Electronic Innovation Through Leadership
Patrick Leteinturier
Infineon

Patrick Leteinturier has 22 years of experience in automotive electronics. He is currently responsible for system architecture of silicon products (silicon sensors, microcontrollers, silicon smart powers, and power modules) for Engine, Transmission and xEV applications at Infineon Technologies AG. He is SAE Fellow.

Mr. Leteinturier started his career at Lucas and SAGEM developing powertrain electronic systems for PSA and Renault. He is a member of SAE International, SIA and IEEE. He holds various patents on automotive electronics, has authored more than 20 SAE publications and is a member of the SAE Engineering Meetings Board. He received the Forest R. McFarland Award in 2008. He has been a guest professor at Tianjin University (China) since 2006. Mr. Leteinturier received his Mechanical Engineering degree from ENSAM: Ecole Nationale Supérieure des Arts et Métiers (France) in 1987 and his Electrical and Electronic Engineering degree from ESE: Ecole Supérieure d’Electricité (France) in 1990.

Bernard Challen
Shoreham Services, Engineering Consultancy

Bernard J. Challen is a Chartered Engineer in England. As former Technical Director with Ricardo Consulting Engineers in the UK, he was responsible for developing noise, vibration and harshness (NVH), electronic controls activities, and for establishing Ricardo’s North American business operation in 1990. During his 21-year career with Ricardo, he also began the company’s engine and vehicle noise and vibration reduction services, working with clients around the world. Challen is a Royal Academy of Engineering Visiting Professor in Principles of Engineering Design at the University of Sussex, England.

A member of SAE International for more than 18 years, Challen has helped organize many conferences, chairing the Noise & Vibration Conference committee and organizing a Powertrain Electronic Controls session at the SAE World Congress. He also has co-authored more than a dozen SAE International technical papers and edited the second edition of the Diesel Engine Reference book. Elected an SAE Fellow in 1997, he also has received three SAE Forest McFarland Awards and the SAE 2008 Medal of Honor. A member of SAE International for more than 18 years, Challen has helped organize many conferences, chairing the Noise & Vibration Conference committee and organizing a Powertrain Electronic Controls session at the SAE World Congress. He also has co-authored more than a dozen SAE International technical papers and edited the second edition of the Diesel Engine Reference book. Elected an SAE Fellow in 1997, he also has received three SAE Forest McFarland Awards and the SAE 2008 Medal of Honor.

Magdi Khair
Watlow Electric

Magdi Khair is retired from Southwest Research Institute where he was Institute Engineer in the Department of Emissions Research. He is experienced in the areas of engine testing and exhaust emissions control. His experience was with AlliedSignal Automotive Catalyst Company, Ford New Holland with primary responsibility for the development of the 6.6 and 7.8 liter midrange diesel engines to meet 1991 emission standards; Bendix Diesel Engine Controls where he led the development of advanced electronic control strategies; and Hyundai where he led the development of advanced electronic control strategies.

Mr. Khair holds 18 U.S. patents in electronic fuel injection, turbocharging, exhaust gas recirculation, and aftertreatment systems. He has also authored and co-authored numerous SAE and ASME papers. Mr. Khair received a B.S. in Automotive Engineering and M.B.A. from Michigan State University.
Panel Discussion: Energizing the Future Mobility (continued)

Wednesday, November 9
The overall challenge of this issue is just beginning to touch our industry and it is significant. While there is no single answer to electric energy usage, there are several avenues to proactive approaches in addressing these issues. A new chapter of the individual mobility is being written. Indeed, individual mobility could use, in the near future, a significant share of electric energy. The overall challenge of this issue is just beginning to touch our industry and it will only become larger as we move more towards vehicle electrification. This panel will address these issues as well.

The economy improvement referenced by President Obama in his 2009 address to Congress was recently highlighted in a report on technologies and government policy developed a robust agenda of industry experts and consultants from industry, academia, and government policy developers to industry standards, medium and heavy-duty. The report also included an assessment of technologies and government policy developments. It is a part of the Energy Independence and Security Act of 2007, its 12 section committee comprised of several experts and consultants from industry, academia, and government policy developers.

AA SAE Member, Dr. Brown was appointed by the National Research Council (NRC) to serve as chair of the Panel on Fuel Economy of Medium and Heavy Duty Vehicles. A part of the Energy Independence and Security Act of 2007, its 12 section committee comprised of several experts and consultants from industry, academia, and government policy developers.

As Executive Director & Chief Technologist, Delphi Corporation, Dr. Brown provides leadership on corporate innovation and technology issues to help achieve profitable competitive advantage. He also represents Delphi globally in outside forums on matters of innovation and technology including government and regulatory agencies, customers, alliance partners, vendors, contracting agencies, academia, etc.

As a NAE member, Dr. Brown was appointed by the National Research Council (NRC) to serve as chair of the Panel on Fuel Economy of Medium and Heavy Duty Vehicles. A part of the Energy Independence and Security Act of 2007, its 12 section committee comprised of several experts and consultants from industry, academia, and government policy developers.

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Andrew Brown, Jr., Pee Feed, PDP NAE
Panel Discussion: How to Bridge Conventional Engine and Powertrain Performance

Some of the recent programs he was responsible for included the development of fleets of electric vehicles, and the development of hydraulic hybrid vehicles. In addition, he also founded the vehicle-reready development work, which includes the development of electric vehicles, and the development of hydraulic hybrid vehicles.

Academic background

Dr. Wolschendorf studied Mechanical Engineering at RWTH in Aachen and subsequently received his doctoral degree in 1990.

1984 - 1990 Research Assistant Imperial College, London

1984 - 1985 Research Assistant Imperial College, London

1985 - 1990 Research Assistant at Aachen University of Technology

1990 Doctor of Engineering (Dr.-Ing.) in Mechanical Engineering at RWTH, Aachen

1990 - 1992 Supervisor, Engine NVH, at FEV Motorentechnik GmbH

1992 - 1996 Project Manager for a Production Diesel Engine Development Program, FEV Engine Technology

1996 - 1999 Project Manager for a Production Diesel Engine Development Program, FEV Engine Technology

1999 - Present Vice-President, FEV Inc., Auburn Hills, MI

1999 - Present Vice-President, FEV Inc., Auburn Hills, MI

2004 - 2006 President, Vehicle System & Drivetrain Engineering Division of FEV, Inc.

2006 - Present Vice-President, Vehicle System & Drivetrain Engineering Division of FEV, Inc.
Moderator

Thomas Reinhart
Southwest Research Institute

This panel will address the issues of complexity in bringing these two systems together and discuss the future of consumer response and its effect on development of technology.

Transmission to Electrified Propulsion System: A Technical and Economic View

Panel Discussion: How to Bridge Conventional Engine & Transmission to Electrified Propulsion System: A Technical and Economic View

Moderator

Thomas Reinhart
Southwest Research Institute

continued on next page
Abstract

In December 2006, Nissan announced its Nissan Green Program 2010 (NGP 2010), a mid-term environmental action plan that includes initiatives to reduce vehicle emissions. The program includes a new hybrid system that incorporates features to improve efficiency and performance.

The system is a one-motor, two-clutch parallel hybrid system. It eliminates the use of a torque converter, which is intended to improve engine efficiency. The system also features innovative wet clutch start control methods using brake through technology, providing the following advantages:

- Simple and lightweight architecture
- High efficiency system with significant improvement in fuel economy in both city and highway modes
- Direct and intuitive feeling with high acceleration
- No sudden shifts or harshness

Nissan resolved these issues by developing breakthrough technologies that ensure the system's effectiveness and efficiency. The presentation will cover the system's outline and differences from a conventional 7-speed automatic transmission, as well as the following examples of novel and innovative features:

- Innovative wet clutch start control method using robust motor controls
- Unique control strategies for engine start-up and shift

This presentation will cover the system's outline, differences from a conventional 7-speed automatic transmission, and the following examples of novel and innovative features.
Volt Transmission
Peter Savagian
Engineering Director
Electrification Architecture and Electric Motor Release Center
General Motors

Pete serves as Engineering Director of GM's Electrification Architecture and Electric Motor Release Center. For the past 12 years, in various roles, he has worked at Hughes Aircraft Company and Sundstrand Avionics in various engineering and power electronics at General Motors and Delco Electric Engineer for GM's Electric Drive Unit. Since 1990, prior to his current assignment, Pete was a Chief Engineer for GM's Electric Vehicle Drive Unit and Electric Motor Release Center. Electric Power Electronics and Control Engineering and Control Engineering Systems and Engineering, Systems and Controls Development and Product Development. Pete has worked on electric vehicle systems and hybrid systems, including hydraulic and electric development. For the past 12 years, in various roles, he has managed project development and advanced engineering for GM's Electrification Architecture and Electric Motor Release Center.

Peter Savagian
Volt Transmission
November 9
Wednesday

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Abstract

Due to the nature of the torque/speed characteristic of typical electric vehicle traction motors, which usually exhibit a high constant torque from zero to base speed, then entering into a constant power region for higher angular velocities, electric vehicles are usually equipped with only a single-speed gearbox in order to minimize the drivetrain mass, volume, losses and cost. Despite the wide operational speed range of such traction motors, the energy consumption of a 2-speed gearbox may be employed in order to increase the wheel torque at low vehicle velocity and, therefore, increase the maximum road gradient that the vehicle can ascend when transporting heavy payloads, for example, whilst also facilitating a reasonable top speed. Moreover, as in some cases the efficiency of the electric motor and, therefore, the transmission efficiency can also affect the overall energy consumption, the selection of the gear ratio is as important as in the case of a conventional vehicle driven by an internal combustion engine. Consequently, the adoption of a 2-speed gearbox can also facilitate significant benefits in terms of the energy consumption by optimizing the distribution of the operating points of the electric motor over a given driving schedule. The selection of the gear ratio leading to the same vehicle efficiency requires an optimization of several design parameters affecting the overall system dynamics for the main simulation results, and sensitivity analyses for the main parameters are presented and discussed. The potential energy savings presented and discussed are significant, and the adoption of a 2-speed transmission system specifically designed for electric drive applications shows the potential of the overall powertrain efficiency.
Correct Transmission for E-mobility Vehicles

Mikael Ingemarson

Wednesday November 9

Abstract

Some generic needs for transmissions in e-mobility vehicles:
- As a range extender optimize to work in the optimum point and work primarily on electric power to improve efficiency.
- For those cases where electric power is the primary drive an increased number of gears for the transmission is prioritized to optimize the electric powertrain. This will introduce a higher degree of electrification.

The trend to electrified vehicles will create new operating conditions for the transmission and thereby new needs. Electrification opens new possibilities to optimize the use of the combustion engine.

With a higher degree of electrification the interaction between the powertrains becomes even more important. The complexity is increased with double powertrains.

The electric motor can contribute with low speed torque and response. This will increase the need to manage torsional vibration insulation and wide span for speed torque and response. This will increase the need to optimize the transmission for low power demand.

Efficiency can be improved with double powertrains where the transmission has a key role. The same line between the two powertrains becomes even more important. With a higher degree of electrification the transmission's operating conditions are changed where the transmission is used as an electric motor.

Efficiency will increase the need to optimize the transmission with low power levels opens new possibilities to optimize the use of the combustion engine.

The efficiency of the electric transmission will create new needs for transmissions in E-mobility.

The need to electrify the vehicle is increased with the number of gears for the transmission and thereby the need to optimize the use of the combustion engine.

The transmission as well as the interaction between them.

With a higher degree of electrification the need to optimize the use of the combustion engine is increased with the number of gears for the transmission.

For those cases where electric power is the primary drive an increased number of gears for the transmission is prioritized to optimize the electric powertrain.

The trend to electrified vehicles will create new operating conditions for the transmission and thereby new needs. Electrification opens new possibilities to optimize the use of the combustion engine.
Abstract

Model-based design is a collection of practices in which a system model is at the center of the development process from requirements definition and system design to implementation and testing [1]. This approach provides a number of benefits such as reducing development time and cost, improving product quality, and guaranteeing a more predictable product through the use of computer models. This presentation describes the complete development cycle carried out using software-in-the-loop and hardware-in-the-loop methods, leading to the development of an engine control unit for a dedicated E-85 engine. The presentation outlines the use of various modeling tools, from GT-Power to Simulink, and of SIL and HIL methods in the development of an in-the-loop method for reducing the development time of engine control units for existing in-the-loop and in-the-field testing platforms. The presentation also describes the role of the Ohio State University Center for Automotive Research (CAR) in the development of future ground vehicle propulsion systems, including advanced engines, electric and hybrid-electric drivetrains, advanced batteries, and fuel cell systems. Dr. Rizzoni has been responsible for the growth of CAR’s research and development capabilities in the areas of advanced powertrains and control systems, and has served as the director of the U.S. Department of Energy’s Center of Excellence for Automotive Technology Education. Since his appointment as Director of CAR, Dr. Rizzoni has been responsible for the growth of the industrial research consortium with sponsorship from 15 major automotive manufacturers, suppliers, and government agencies. In 2008, he launched a consortium, SMART@CAR, to study problems related to PHEVs and the smart grid.

Notes

Wednesday, November 8

Control Unit Using SIL and HIL Tools

Development of the OSU ECOCAR Dedicated E-85 Engine
Abstract

The advent of electrification of powertrain has brought with it many advances in efficiency but also new potential hazards and hazardous situations. This paper will outline the new ISO 26262 functional safety standard for microcontrollers for automotive and industrial applications and describe some of the assessment and mitigation techniques required at system, hardware, software, process and organisational levels. The paper will also discuss some of the scenarios where electrification creates new potential hazards, and describe some of the scenarios where electrification creates new hazards and hazardous situations. This paper will also outline the potential new hazards and hazardous situations. This paper will also outline the potential new hazards and hazardous situations.

Simon P. Brewerton
Senior Principal Microcontrollers
Infineon Technologies
After serving an engineering apprenticeship at Land Rover in the UK, Simon Brewerton joined Siemens Microelectronics in Detroit USA. He holds a degree in Cybernetics and Mathematics from the University of Reading, England and is currently Senior Principal for Safety Integrity at Infineon Technologies Bristol, UK where he is responsible for the definition of advanced microcontrollers at key Tier 1 suppliers for automotive applications. He has held a degree in Cybernetics and Mathematics from the University of Reading, England and is currently Senior Principal for Safety Integrity at Infineon Technologies Bristol, UK where he is responsible for the definition of advanced microcontrollers at key Tier 1 suppliers for automotive applications.
Abstract

Simulation assists Vehicle and Powertrain Optimization and Component Selection

Tuesday November 8

SAE 2011 Electronic Systems for Vehicle Propulsion Symposium - For Improved Engine and Powertrain Performance
How will Alternative Fuels Affect Powertrain Electronics?

Prof. Jon H. Van Gerpen

Jon Van Gerpen is Professor and Department Head of Biological and Agricultural Engineering at the University of Idaho. He has held that position since July 2004. Before that, he was a Professor of Mechanical Engineering at Iowa State University. Dr. Van Gerpen received his B.S. (1978), M.S. (1980), and Ph.D. (1984) degrees in Mechanical Engineering from Iowa State University.

Abstract

Ethanol and biodiesel are being added to gasoline and diesel fuel. The use of alternative fuels has led to new options for powertrain electronics. This presentation will discuss the impact of alternative fuels on powertrain electronics including material compatibility, stoichiometry changes, and impacts on power, emissions, and efficiency.
Abstract

Exhaust aftertreatment is not only a major part of the engine and emissions system but also plays an important role in improving vehicle fuel economy. Complexity of exhaust aftertreatment systems is an important challenge for both heavy-duty and light-duty vehicles. This presentation reviews the current state of technology in developing and implementing advanced exhaust aftertreatment control technologies and discusses the need for more precise control of emissions and on-board diagnosis. This presentation will review the current complexity of exhaust aftertreatment control technologies and discusses the need for more precise control of emissions and on-board diagnosis. The presentation will cover technologies currently available and the challenges that lie ahead. The focus will be on improving vehicle fuel economy, reducing emissions, and improving the overall performance of the exhaust aftertreatment system.
Abstract

A diverse spectrum of highly capable diesel catalytic emission control technologies has emerged in the recent years, in response to stringent environmental regulations. These technologies include a variety of particulate filters, exhaust gas recirculation, and selective catalytic reduction systems, among others. The implementation of these technologies requires sophisticated engine control strategies, including real-time monitoring of emission levels and adjustments to engine parameters to optimize performance.

Despite these impressive developments, many challenges remain, including:

• The need for improved NOx reduction and particle trapping efficiency.
• The requirement for more effective control of emissions from alternative fuels.
• The need for better understanding of the underlying chemical processes.

These challenges highlight the importance of continued research and development to improve the performance and reliability of diesel catalytic emission control systems.
Particle emissions from highway diesel engines and vehicles have been reduced drastically over the last two decades. The recent introduction of high efficiency exhaust particle filters on model year 2007 and 2008 European Union (EU) and 2007 and 2008 California Air Resources Board (CARB) regulations introduced by the California Air Resources Board (CARB) and the European Union (EU), respectively, have resulted in near-zero levels of particulate matter (PM) emissions. The use of exhaust particle filters on modern diesel engines and vehicles sold in the US in 2016 and in Europe since 2007 has led to a significant reduction of PM emissions from modern diesel engines. However, as discussed in previous work, the use of exhaust particle filters has also led to some increases in fuel economy and greenhouse gas emissions. This presentation addresses the issue of diesel PM emissions and highlights the significant progress made and the issues that need to be addressed moving forward.

Abstract

Significant progress has been made in reducing particle emissions from diesel and gasoline engines. It is highlighted in this presentation that the use of particle filters on diesel engines has led to near-zero levels of PM emissions. However, the use of exhaust particle filters on modern diesel engines has also led to some increases in fuel economy and greenhouse gas emissions. This presentation addresses the issue of diesel PM emissions and highlights the significant progress made and the issues that need to be addressed moving forward.

Dr. Imad A. Khalek
Senior Program Manager
Southwest Research Institute

Dr. Khalek has been working on particle emissions from combustion sources for over 40 publications. He is the organizer of the SAE Particle Emissions from Combustion Sources session. He has been awarded numerous presentations worldwide and is an active member of the Nanoparticle Laboratory in Southwest Research Institute, Department of Emissions Research. He has been a member of the SAE Engine Emissions Research team since 1991. Dr. Khalek also serves as the chair of the SAE Particle Emissions from Combustion Sources session. He is the founder of the Nanoparticle Laboratory in Southwest Research Institute, Department of Emissions Research. He has been a member of the SAE Engine Emissions Research team since 1991. Dr. Khalek also serves as the chair of the SAE Particle Emissions from Combustion Sources session.

Conventional multipoint (fuel) injection (MPF) stoichiometric gasoline engines that are widely used in the marketplace already enjoy very low particle emissions. Particle emissions from modern gasoline engines using MPFI are also well below the regulatory limit, similar to modern diesel engines. However, gasoline direct injection (GDI) engines are gaining more momentum and are expected to represent 50% of modern vehicle sales in the US in 2016. Recent work with gasoline direct injection (GDI) engines shows some increase in particle emissions, compared to conventional gasoline engines and modern diesel engines. The use of exhaust particle filters on modern GDI engines has led to significant reductions in particle emissions. However, as discussed in previous work, the use of exhaust particle filters on modern GDI engines has also led to some increases in fuel economy and greenhouse gas emissions. This presentation addresses the issue of GDI PM emissions and highlights the significant progress made and the issues that need to be addressed moving forward.

Tuesday, November 8

Dr. Imad A. Khalek
The Diesel Engine - Looking to the Future

Abstract

The Compression Ignition engine faces some specific challenges and opportunities as we contemplate a future that demands ever improved fuel efficiency, with lower CO2 emissions. Starting from a position of relative high efficiency, it is being asked to make significant improvements while also adapting to low carbon fuels and an Industry-wide trend toward the electrified vehicle. This presentation discusses some of the likely Industry responses and related issues, and projects a future in which the diesel engine will still play a very key role.

Philip Dingle
Delphi Corporation

Mr. Philip Dingle is a Diesel Technology Specialist in the Advanced Diesel Engineering group of Delphi Diesel Systems. He received his engineering education in England, and after graduating in 1972, joined the R&D group of Lucas Diesel Systems. Transferred to Detroit, USA in 1975, he has worked closely with several US diesel engine manufacturers on the application of fuel injection for their engines. In the process, he gained broad experience in achieving performance and emissions targets from both light and heavy duty engines. He holds twenty US or European patents for fuel system innovation.
Abstract

There are many technical challenges facing the controls development community which arise underpinned by the increasing requirements and associated technical challenges driving the development of engine controls. While the primary drivers to date have been generated by globally tightening legislation for fuel efficiency and tailpipe emission reduction, combined with ever increasing customer demand for performance, there are many additional challenges, as well as opportunities, for enhancing the controls through system integration and optimization. By virtue of the significant amount of applied research on these high-dimensional systems with the modern automotive engine continues to increase, new challenges are being posed on the control system to achieve the required efficiencies. The primary drivers continue to be generated by the increasing customer demand for performance and increasing powertrain efficiency. However, the challenges associated with the modern automotive engine require the development of new control strategies for both current and future applications. These are many technical challenges facing the controls development community.
Control of Engine for Hybrid Vehicle Emission

November 8

Tuesday
The change in powertrain and vehicle technology due to environmental concerns, fuel price, and fuel economy regulations over the past years has been tremendous. New technologies to further increase and improve on emissions standards such as fuel efficiency and environmental performance have been developed, deployed, and rapidly implemented. In addition, there is increased and improved on powertrain and vehicle technologies such as drivability, performance, and fuel efficiency. Recent years have seen a major change in powertrain and vehicle technology due to environmental concerns. The increase in powertrain and vehicle technology has led to advancements in fuel efficiency and environmental performance.

The combustion engine is a prime power source or as a backup solution in case of a range extender. The combustion engine requires further optimization to cope with the current and future requirements. This includes measures such as downsizing, turbo- or supercharging, combustion system adjustments, after-treatment solutions, etc. Furthermore, an efficient integration of the engine into the vehicle to optimize functionality, minimize space claim, and leverage synergy effects have become a must. In addition, a new generation of fuels that is of interest for future applications as well as bi-fuel applications need to be considered. The combustion engine as a prime power source or as a backup solution in case of a range extender is of interest for future applications.

The change in powertrain and vehicle technology due to environmental concerns, fuel price, and fuel economy regulations over the past years has been tremendous. New technologies to further increase and improve on emissions standards such as fuel efficiency and environmental performance have been developed, deployed, and rapidly implemented. In addition, there is increased and improved on powertrain and vehicle technologies such as drivability, performance, and fuel efficiency. Recent years have seen a major change in powertrain and vehicle technology due to environmental concerns. The increase in powertrain and vehicle technology has led to advancements in fuel efficiency and environmental performance.
Notes

The thermal dynamics and combustion systems. For instance, PCCI (partial premixed charge) combustion modes, which combine premixed and diffusion combustion phases, can reduce NOx, CO, and THC emissions. Thermal efficiency and power output can be improved by optimizing fuel-air mixtures and combustion strategies. Additionally, exhaust gas recirculation (EGR) can be used to control combustion processes and reduce emissions.

André Boehman is an expert in alternative and reformulated fuels, combustion, and pollution control. His research interests include alternative diesel fuels, diesel combustion, and diesel exhaust aftertreatment. He has received several awards for his contributions, including the 2009 John Johnson Award for Outstanding Research in Diesel Engines and the 2009 Arch T. Colwell Merit Award from the Society of Automotive Engineers.

André Boehman is a Professor of Fuel Science and Materials Science and Engineering in the Energy and Mineral Engineering Department at the Pennsylvania State University. He has taught courses on energy, fuels, combustion, and the environment since 1994. He holds a BS in Mechanical Engineering from the University of Dayton (1986) and an MS (1987) and PhD (1993) in Mechanical Engineering from Stanford University.

Abstract

The efficiency of energy conversion of chemical energy stored in the fuel to mechanical energy is strongly affected by the peak cylinder pressure and temperature. The efficiency is also controlled by the cylinder pressure and temperature within the cylinder. These parameters change with the cylinder filling, compression, and thermodynamic processes. The efficiency is strongly affected by the peak cylinder pressure and temperature within the cylinder.
Panel Discussion: How to Bridge Conventional Engine & Transmission to Electrified Propulsion System: A Technical and Economical View

Moderators - Thomas Reinhart, Southwest Research Institute
Panelists - Robert Gruszczynski, Volkswagen of America
Jay Iyengar, Chrysler LLC
Peter Savagian, General Motors Education Relations
Yukata Takamura, Nissan Motor Company, Ltd.
Joachim Wolschendorf, FEV Inc.
Martin Zimmerman, University of Michigan

This panel will address the issues of complexity in bridging these two systems together and discuss the future of consumer response and its effect on development of technology.

Panel Discussion: Energizing the Future: Mobility

Moderators - Andrew Brown, Delphi Corp.
Panelists - Gary Cameron, Delphi Corp. (Retired)
Linos Jacovides, Delphi Corp. (Retired)
Frank Klegon, Fokus Associates LLC
Patrick Leteinturier, Infineon Technologies
Ravi Pandit, KPIT Cummins Infosystems, Ltd.

A new chapter of the individual mobility is being written. In the near future significant share of the mobile energy will come from electric vehicles. The overall challenge of this issue is not finding a solution, but finding a better solution. Panelists will discuss opportunities to proactively approach energy usage.

Networking Refreshment Break w/Exhibits

3:30 p.m.

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The focus of Day Two is on transmission electronics and current and future powertrain technology issues. The day begins with a plenary keynote from a government representative addressing their view on the future of electronics. The rest of the morning is dedicated to all the developments surrounding transmission control.

Transmission Control

Networking Refreshment Break w/Exhibits

8:00 a.m.

Jerry D. Gonder, National Renewable Energy Laboratory

Air Conditioners/Heaters

9:00 a.m.

John Warren Fairbanks, US Dept. of Energy

Plenary Keynote - Automotive Thermoelectric Generators

9:30 a.m.

Institute for Energy, Environment & Sustainability Services

Plenary Keynote - Leveraging Intelligent Vehicle Technologies

10:00 a.m.

Klaes Burgdorf, Volvo Car Corporation

The Correct Transmission for E-mobility Vehicles

10:30 a.m.

Peter Savagian, General Motors

Volt Transmission

11:00 a.m.

Fabio Viotto, Cerakron Cazacan Drive Systems

Development of Nissan’s Original Parallel Full Hybrid System

11:30 a.m.

Peter Savagian, General Motors

Volt Transmission

10:30 a.m.

Fabio Viotto, Cerakron Cazacan Drive Systems

A Novel Seamless 2-Speed Transmission System for Electric Vehicles

10:00 a.m.

Klaes Burgdorf, Volvo Car Corporation

The Correct Transmission for E-mobility Vehicles

9:30 a.m.

Klaas Burgdorf, Volvo Car Corporation

8:00 a.m.

Networking Lunch with Exhibits
SAE 2011 Electronic Systems for Vehicle Propulsion Symposium - For Improved Engine and Powertrain Performance

11:00 a.m.
Catalytic Diesel Emissions Control
Aleksey Yezerets, Cummins Inc.

1:00 p.m.
Complexity of Controls Systems for Aftertreatment
Yiqun Huang, Houston Advanced Research Center

1:30 p.m.
Networking Refreshment Break w/Exhibit

2:00 p.m.
Development of the OSU EcoCAR Dedicated E-85 Engine Control Unit using SIL and HIL Tools
Simon R. Prevost, Inherent Technologies Inc.

3:00 p.m.
Simulation Assists Vehicle and Powertrain Optimization and Component Selection
Thomas Morel, Gamma Technologies Inc.

3:30 p.m.
How will Alternative Fuels Affect Powertrain Electronics?
Jon H. Van Gerpen, Univ. of Idaho

4:00 p.m.
Safety Integrity
Simon P. Brewerton, Infineon Technologies

4:30 p.m.
Development of the OSU EcoCAR Dedicated E-85 Engine Control Unit using SIL and HIL Tools
Giorgio Rizzon, Katherine Bovee, Ryan Everett, Shawn W., Midlam-Mohler, Ohio

5:00 p.m.
Calibration
TBD

5:30 p.m.
Joint Exhibit and Networking Reception

Development Method & Calibration
TBD

Networking Refreshment Break w/Exhibit

Tuesday
November 8
Salons ABC

Wednesday
November 9

Tuesday
November 8
Salons ABC

Tuesday
November 8
Salons ABC

Tuesday
November 8
Salons ABC

Tuesday
November 8
Salons ABC

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November 8
Salons ABC

Tuesday
November 8
Salons ABC
The focus of day one will be on engine control, control & aftertreatment, as well as development of emission technology.
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Special Events

Lunch & Exhibit
11:30 a.m. - 1:00 p.m.
Salon D, E, F, G, H

Networking Refreshment Breaks & Exhibit
3:00 - 3:30 p.m.
9:00 - 9:30 a.m.
Salon D, E, F, G, H

Leveraging Intelligent Vehicle Technologies

Wednesday
November 9

8:30 - 9:00 a.m.
Salon ABC

Jeffrey D. Gonder
Senior Engineer
National Renewable Energy Laboratory (NREL)

Jeffrey joined NREL in 2005, where he has led both simulation and hardware testing projects to study advanced powertrain systems. His research interests include optimal design and sizing of energy storage systems and high-performance electric vehicles. He has also investigated the impact of drive cycle and intelligent vehicle technologies on fuel economy. Jeffrey holds a B.S. in Mechanical Engineering from the University of Colorado and an M.S. in Mechanical Engineering from Penn State University. His work prior to joining NREL included developing a plug-in hybrid fuel cell vehicle for Anuvu ("A new view").
John Fairbanks began at the Department of Energy in 1977 to work on stationary power gas turbine components developed from aircraft gas turbine engine technology. He developed an approach to test and evaluate durability of diesel and gas turbine engines to operate on low quality petroleum and coal derived liquid fuels. He developed the Combustion Zone Approach technology to enable diesel and gas turbine engines to operate on low quality petroleum and coal derived liquid fuels. This program focused on developing technology to enable diesel and gas turbine engines to operate on low quality petroleum and coal derived liquid fuels. He worked on the development of Combustion Zone technology to enable diesel and gas turbine engines to operate on low quality petroleum and coal derived liquid fuels. He developed the Combustion Zone Approach technology to enable diesel and gas turbine engines to operate on low quality petroleum and coal derived liquid fuels.

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The US Department of Energy has initiated a jointly funded program with its European counterparts to develop advanced automotive TEG’s. The teams selected and their approaches will be presented.

Energy conditioned competitive programmation to accelerate scale up and manufacturing of TEG’s. The DOE/NETL announced in early 2011 the Department of Energy’s response to the DOE/NSF announcement. Responding to the DOE/NSF announcement, 9 of the 48 universities who applied to the Industrial Science Foundation (ISF) to fund university and industrial teams to develop advanced thermoelectric (TE) materials.

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Gradu was born in Bucharest, Romania. From the Polytechnic Institute in Bucharest, Romania (1987), Gradu holds a Doctorate in Mechanical Engineering from the University of Stuttgart in Germany (1996) and a Master’s Degree in Mechanical Engineering from the Polytechnic Institute in Bucharest, Romania (1987). Gradu enjoys travel and outdoor recreation, including mountain biking, kayaking, and kiteboarding. He enjoys teaching and outdoor recreation, including mountain biking, kayaking, and kiteboarding.

Relax environment of drinks and appetizers.

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You have the opportunity to network with your fellow attendees and speakers in a relaxed environment of drinks and appetizers. You also have the opportunity to network with your fellow attendees and speakers in a relaxed environment of drinks and appetizers.

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Plenary Keynote - The Future of Propulsion Electronics
8:00 – 9:00 a.m.
Salons ABC

Salon ABC

Tuesday, November 8

Mircea Gradu
Vice President and Head of Transmission Powertrain and Driveline Engineering, Chrysler Group LLC

Mircea Gradu was appointed Vice President and Head of Transmission Powertrain and Driveline Engineering in July 2011. In this position, Mr. Gradu will be responsible for the design, development, and release of all Transmission and Driveline systems for Chrysler Group LLC. Additionally, Mr. Gradu is a member of the Product Committee and is responsible for identifying, developing, and deploying virtual engineering capabilities. Furthermore, he is responsible for the design, development, and release of all Transmission and Driveline systems for Chrysler Group LLC.

Significant elements of Mr. Gradu’s professional background include:

• 2011, Vice President and Head of Transmission Powertrain and Driveline Engineering, Chrysler Group LLC
• 2009, Head of Virtual Tools Analysis and Head of Transmission and Driveline Engineering, Chrysler Group LLC
• 2007, Director – Transmission and Driveline Engineering, Chrysler Group, DaimlerChrysler
• 1998, Director and Chief Engineer – The Timken Company
• 1996, Project Manager – Product Development, Inc.
• 1993, Project Engineer and Team Leader - Drive Systems and NVH, Daimler
• 1990, Project Engineer and Team Leader - Drive Systems and NVH, Daimler

Mr. Gradu joined Chrysler in 2007 as Director - Transmission and Driveline Engineering.
<table>
<thead>
<tr>
<th>9:00 – 9:30 a.m.</th>
<th>Networking Lunch and Exhibits</th>
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<tbody>
<tr>
<td>9:30 – 11:30 a.m.</td>
<td>Transmission Control and Exhibits</td>
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<td>11:30 a.m. – 1:00 p.m.</td>
<td>Networking Lunch and Exhibits</td>
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<td>6:30 – 7:00 p.m.</td>
<td>Networking Reception</td>
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<td>3:00 – 3:30 p.m.</td>
<td>Networking Reception</td>
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<tr>
<td>10:00 – 11:15 a.m.</td>
<td>Plenary Keynote: Vehicular Applications of Thermoelectrics</td>
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<tr>
<td>11:15 a.m. – 1:00 p.m.</td>
<td>The Future of Propulsion Electronics Panel Discussion:</td>
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<tr>
<td>8:00 – 8:30 a.m.</td>
<td>Plenary Keynote: What Can be Done with Intelligent Vehicles in the Way of Fuel Economy</td>
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<tr>
<td>8:30 – 9:00 a.m.</td>
<td>Plenary Keynote: How to Bridge Conventional Engine and Transmission to Electrified Propulsion System: A Technical and Economic View</td>
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<td>9:00 – 9:30 a.m.</td>
<td>Networking Refreshment Break</td>
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<tr>
<td>9:30 – 11:00 a.m.</td>
<td>Panel Discussion: Engine Control and Aftertreatment</td>
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<tr>
<td>11:00 – 12:30 p.m.</td>
<td>Networking Lunch and Exhibits</td>
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<tr>
<td>12:30 – 1:00 p.m.</td>
<td>Lunch sponsored by</td>
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<tr>
<td>1:00 – 3:00 p.m.</td>
<td>Panel Discussion: How to Bridge Conventional Engine &amp; Transmission to Electrified Propulsion System: A Technical and Economic View</td>
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<tr>
<td>3:00 – 3:30 p.m.</td>
<td>Networking Refreshment Break</td>
</tr>
<tr>
<td>3:30 – 5:30 p.m.</td>
<td>Panel Discussion: Energizing the Future of Mobility</td>
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<td>5:30 – 7:00 p.m.</td>
<td>Networking Reception</td>
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**Event-at-a-Glance**

- Each session will focus on systems-level issues critical to vehicle electrification, powertrain, and electrification.
- This event will address the entire vehicle electronics infrastructure and the application of vehicle electronics technology for HEV, EV, and ICE vehicles. Hear experts from OEM, integrators, tier suppliers, and academia address issues critical to vehicle engine, powertrain, and electrification.

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