2013 Active Safety Systems Symposium

November 5-7, 2013
Doubletree Hotel Detroit/Dearborn, Michigan, USA

An SAE Convergence® Program

http://www.sae.org/events/cass

EVENT GUIDE
Includes Final Program and Exhibit Directory
ATTENTION SAE EVENT ATTENDEES:

FOR MORE SAE INTERNATIONAL MOBILITY SAFETY RESOURCES....

engineering.sae.org/mymobilitysafetyinfo

Check out this featured product and others.
| Monday  
November 4 | Tuesday  
November 5 | Wednesday  
November 6 | Thursday  
November 7 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Registration Sponsor:</strong></td>
<td><strong>Registration Sponsor:</strong></td>
<td><strong>Registration Sponsor:</strong></td>
<td><strong>Registration Sponsor:</strong></td>
</tr>
<tr>
<td>[Bosch Logo] Invented for life</td>
<td>[Ford Logo]</td>
<td>[Ford Logo]</td>
<td>[Ford Logo]</td>
</tr>
<tr>
<td>7:30 a.m. – 6:00 p.m. Registration</td>
<td>7:30 a.m. – 3:30 p.m. Registration</td>
<td>7:30 a.m. – 1:00 p.m. Registration</td>
<td>8:30 – 10:00 a.m. Technical Session Understanding Human Factors &amp; Crash Analysis for Active Drive Assist Systems</td>
</tr>
<tr>
<td>8:30 – 10:00 a.m. Technical Session Near Term Technologies (0-7 yrs.)</td>
<td>8:30 – 10:00 a.m. Technical Session Long Term Technologies (7+ yrs.)</td>
<td>10:30 a.m. – 12:00 p.m. Technical Session Understanding Human Factors &amp; Crash Analysis for Active Drive Assist Systems</td>
<td></td>
</tr>
<tr>
<td>10:00 – 10:30 a.m. Networking Break</td>
<td>10:00 – 10:30 a.m. Networking Break</td>
<td>10:00 – 10:30 a.m. Networking Break</td>
<td>12:00 – 1:00 p.m. Networking Lunch</td>
</tr>
<tr>
<td>10:30 a.m. – 12:00 p.m. Technical Session Near Term Technologies (0-7 yrs.)</td>
<td>10:30 a.m. – 12:00 p.m. Panel Discussion Perspective on Mass Deployment Strategies</td>
<td>10:30 a.m. – 12:00 p.m. Technical Session Understanding Human Factors &amp; Crash Analysis for Active Drive Assist Systems</td>
<td></td>
</tr>
<tr>
<td>12:00 – 1:00 p.m. Networking Lunch</td>
<td>12:00 – 1:00 p.m. Networking Lunch</td>
<td>12:00 – 1:00 p.m. Networking Lunch</td>
<td></td>
</tr>
<tr>
<td>1:00 – 3:30 p.m. Technical Session Near Term Technologies (0-7 yrs.)</td>
<td>1:00 – 3:30 p.m. Technical Session Long Term Technologies (7+ yrs.)</td>
<td>1:00 – 3:00 p.m. Technical Session Active &amp; Passive Safety Integration</td>
<td></td>
</tr>
<tr>
<td>3:00 – 6:00 p.m. Early Bird Registration</td>
<td>3:30 – 4:00 p.m. Networking Break</td>
<td>3:30 – 4:00 p.m. Networking Break</td>
<td>3:00 – 4:30 p.m. Panel Discussion Active &amp; Passive Safety Integration</td>
</tr>
<tr>
<td>4:00 – 4:30 p.m. Technical Session Near Term Technologies (0-7 yrs.)</td>
<td>4:00 – 5:00 p.m. Technical Session Long Term Technologies (7+ yrs.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:30 – 6:00 p.m. Expect Panel Discussion Infrastructure, Test Bed and Implementation (Test Performance)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6:00 – 7:00 p.m. Networking Reception</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SAE 2013 Active Safety Systems Symposium

SAE INTERNATIONAL
Warrendale Office
400 Commonwealth Drive
Warrendale, PA 15096-0001
USA
Phone: 1-724-776-4841
Fax: 1-724-776-0790
Customer Service
1-877-606-7323
(toll free U.S. and Canada)
1-724-776-4970
www.sae.org
customerservice@sae.org
Troy Office
755 W. Big Beaver Rd.
Troy, MI 48084
Phone: 1-248-273-2455
Fax: 1-248-273-2494

EMERGENCY HOTLINE
1-800-581-9295

SAE 2013 ENGINEERING MEETINGS BOARD

CHAIRPERSON
Dr. Pranab Saha, PE
Kolano and Saha
Engineers, Inc.

PAST CHAIRPERSON
Dr. Kamran Rokhsaz
Wichita State University

MEMBERS
Air and Space Group
(ASG) Chair
John C. Dalton
Boeing Company
Land and Sea Group
(LSG) Chair
Scott Sluder
Oak Ridge National Laboratory

Service Technology Program
Committee (STPC) Chair
Kathy Kedzior
Mahle Powertrain, LLC

Sustainable Development
Program Committee
(SDPC) Chair
Sujit Das
Oak Ridge National Laboratory

Technical Quality Response Team
(TQRT) Chair
Christopher Shaw
Visteon Corporation

MEMBERS-AT-LARGE
David Amirehteshami
The Boeing Company
Joseph J. Barkai
IDC Manufacturing Insights

Prof. Samir N. Y. Gerges
Federal University of Santa
Catarina

Wei-Jian Han, Ph.D.
Ford Motor Company

Alain P. Jablonowski
Robert Bosch LLC

Patrick Leteinturier
Infineon Technologies AG

James C. Miller
Deere & Company

Dr. Matthew S. Newkirk
Afton Chemical Corporation

June Ogawa
The Boeing Company

Dr. Cornelius N. Opris
Caterpillar Inc.

Gerald S. Shoemaker
Cessna Aircraft Company

Nakia Simon
Chrysler Group LLC

Prof. Richard K. Stobart
Loughborough University

Arnold A. Taube, PE
Deere & Company

Dr. Kamal Kishore C. Vora
ARAI Academy

H. Robert (Bob) Welge
Robert’s Engineering
Development

Secretary
Patti Kreh
SAE International

HOURS OF OPERATION

REGISTRATION
Great Lakes Ballroom Foyer
Monday, November 4
4:30 - 6:00 p.m.
Tuesday, November 5
7:30 a.m. - 6:00 p.m.
Wednesday, November 6
7:30 a.m. - 3:30 p.m.
Thursday, November 7
7:30 a.m. - 1:00 p.m.

ON-SITE REGISTRATION FEES
SAE Classic Member   $895
SAE Premium Member   $795
SAE Elite Member   $745
Non-Member    $1295
Technical Program Participant
(organizers and speakers) Free

Day 3 Only - Friday November 7, 2013 -
Understanding Human Factors and Crash
Analysis for Active Drive Assist Systems

SAE Member $425
Non-Member $825

Registration & Lanyard Sponsor:

TECHNICAL SESSIONS
Superior Ballroom
Tuesday, November 5
8:30 a.m. – 6:00 p.m.
Wednesday, November 6
8:30 a.m. – 5:00 p.m.
Thursday, November 7
8:30 a.m. – 4:30 p.m.

EXHIBITS
Michigan Ballroom

NETWORKING LUNCHES
Michigan Ballroom
Tuesday – Thursday, November 5 - 7
12:00 – 1:00 p.m.

Tuesday Lunch
Sponsor:

NETWORKING BREAKS
Michigan Ballroom
Tuesday – Wednesday, November 5 - 6
10:00 – 10:30 a.m.
3:30 p.m. – 4:00 p.m.
Thursday November 7
10:00 – 10:30 a.m.

SAE 2013 INGFORMATION

SAE 2013 Engineering Meetings Board
SAE INTERNATIONAL OFFICERS - 2013

OFFICERS
Donald G. Hillebrand, PhD
President
Frank O. Klegon
2012 President
Daniel M. Hancock
2014 President Nominee
Gregory E. Saunders
Vice President – Aerospace
Jeff Hemphill
Vice President – Automotive
Bharat Vedak
Vice President – Commercial Vehicle
Ronald G. Rath
Treasurer
Robert Ireland
Assistant Treasurer
David L. Schutt, PhD
Chief Executive Officer
Gregory L. Bradley
Secretary

DIRECTORS
Paul “Scooter” Brothers
Susan Collet
David J. Gorsich, PhD
Richard Greaves, CEng
Klaus Hoehn, PhD
Arun Kumar Jaura, PhD
Yoshio Kawakami
Louis Kratz
Sandra Krug, PhD
Patrick Leteinturier
Sun Wing Lui, PhD
Charon Morgan
Srinivas R. Srinath, PhD
David Vasquez

CONSENT TO USE OF IMAGES
Please note that photographs and video taken by or on behalf of SAE International of event activities and attendees shall be the property of SAE International. By registering for an SAE International event, you consent to the use by SAE International of any photograph or video in which you appear, including for promotional purposes, in print, digital, or other format, without notice or compensation to you.

OPEN EXCHANGE OF IDEAS
The purpose of this session is to provide an open exchange of ideas. Remarks made by participants or members of the audience cannot be quoted or attributed to the individual or their company unless express permission has been granted by the individual and their company. Any record of remarks, discussion, or photographs may not be used unless express permission has been granted by the individual and their company.
TECHNICAL PROGRAM

TUESDAY
NOVEMBER 5

(See pages 12-31 for complete abstract and biography)

NEAR TERM TECHNOLOGIES (0-7 YRS.)

8:30 a.m.
OPENING KEYNOTE:
ACTIVE SAFETY SYSTEMS: ITS PROMISES, POSSIBILITIES AND
CHALLENGES IN ACHIEVING TOTAL SAFETY
Dr. Joseph Kanianthra, Active Safety Engineering LLC (Retired, NHTSA)

9:00 a.m.
WHAT DO REAL WORLD RESULTS SAY ABOUT DRIVERS AND THE
DESIGN OF FUTURE DRIVER ASSISTANCE SYSTEMS?
Dr. Adrian Lund, Insurance Institute of Highway Safety

9:30 a.m.
ACTIVE SAFETY TECHNOLOGIES – STRATEGY FOR MEETING GOAL OF
ZERO FATALITIES
Lex Kerssemakers, Volvo Car Overseas Corporation

10:00 a.m.
NETWORKING BREAK

10:30 a.m.
CURRENT STATE OF TRANSITION FROM ASSISTANCE TO AUTONOMY
(AN OEM PERSPECTIVE)
John Capp, General Motors LLC

11:00 a.m.
DRIVER ASSIST AND ACTIVE SAFETY DESIGN AT FORD MOTOR
COMPANY
Jerry Engelman, Ford Motor Company

11:30 a.m.
MEETING THE DATA NEEDS FOR FUTURE SAFETY
Augustus Chidester, U.S. Department of Transportation

12:00 p.m.
NETWORKING LUNCH

1:00 p.m.
NISSAN’S TECHNOLOGIES BASED ON SAFETY SHIELD CONCEPT
Andrew Christensen, Nissan Technical Center North America

1:30 p.m.
TOYOTA’S ACTIVE SAFETY SYSTEM STRATEGY
Yukihiro Ikeda, Toyota Motor Corporation

2:00 p.m.
INTEGRATED SAFETY - OPPORTUNITIES, CHALLENGES AND NEEDS
FOR THE NEXT GENERATION OF VEHICLE SAFETY
Klaus Kompass, BMW Group

2:30 p.m.
PRE-COLLISION SYSTEM PERFORMANCE EVALUATION
Rini Sherony, Toyota Motor Engineering & Mfg. NA Inc.
3:00 p.m.
ACTIVE SAFETY VIA SIMULATION: PAST, PRESENT AND (PREDICTING THE) FUTURE
Dr. Mark Elwell, TRW Automotive US LLC

3:30 p.m.
NETWORKING BREAK

4:00 p.m.
SUPPLIER VIEW OF ACTIVE SAFETY
Speaker, TBD

4:30 p.m.
EXPERT PANEL DISCUSSION: INFRASTRUCTURE, TEST BED AND IMPLEMENTATION (TEST PERFORMANCE)
SCOPE: In this panel discussion, industry experts and practitioners will discuss how they developed the test procedures; application of test surrogates, active drive assist system countermeasures, driver work load assessments, electronic and vision based sensing capabilities as well as other smart architecture and vehicle technologies evaluation methods. The panel will also address challenges that currently exist in preventing or inhibiting implementation and will consider how these might be overcome.

Moderator:  John Maddox, UMTRI
Panelists:  Matthew Avery, Motor Insurance Repair Research Centre
Anders Eugensson, Volvo Cars of North America LLC
Richard Schram, Euro NCAP
David Zuby, Insurance Institute for Highway Safety

6:00 p.m.
NETWORKING RECEPTION

HIGH OCTANE FUELS SYMPOSIUM
WHERE CAFE AND RFS MEET
January 21, 2014
Washington, D.C., U.S.A.
WWW.SAE.ORG/EVENTS/HOFS

High octane fuels are the focus of this inaugural event from SAE International – are they a part of our future? The confluence of CAFE and RFS requirements presents an opportunity to embrace higher octane gasoline blends that enable the production of a new generation of vehicles with improved fuel efficiency. Join your colleagues and experts from industry in the discussion of the benefits and challenges posed by higher octane fuels.
LONG TERM TECHNOLOGIES (7+ YRS.)

8:30 a.m.
PLENARY KEYNOTE:
LONG TERM VIEW OF ACTIVE SAFETY AS SEEN BY GOOGLE
Anthony Levandowski, Google Inc.

9:00 a.m.
TECHNOLOGIES AND TOOLS FOR THE DEVELOPMENT AND TEST OF ACTIVE SAFETY SYSTEMS
Vivek Moudgal, dSPACE Inc.

9:30 a.m.
EVOLUTION FROM ASSISTED TO AUTOMATED DRIVING
Holger Schanz, Continental Corporation

10:00 a.m.
NETWORKING BREAK

10:30 a.m.
EXPERT PANEL DISCUSSION: PERSPECTIVE ON MASS DEPLOYMENT STRATEGIES
SCOPE: In this panel discussion, OEMs, industry analysts and tier suppliers will discuss the state of active safety 7 years from now and what will be the challenges to implement technologies in a vehicle platform and in their large scale deployment. What state will autonomous driving be in? What will the potential active drive assist systems look like? Will there be full integration between active and passive safety systems? The panel will also address these topics plus the challenges such as consumer acceptance, costs, unintended consequences and government regulations, how these might affect safety.

Moderator: Gerry Conover, PRC Associates
Panelists: John Capp, General Motors LLC
           Hideki Hada, Toyota Motor Engineering & Mfg. NA Inc.
           Christian Schumacher, Continental Automotive Systems
           Kay Stepper, Bosch LLC
           David Zuby, Insurance Institute for Highway Safety

12:00 p.m.
NETWORKING LUNCH

1:00 p.m.
SYSTEM ROBUSTNESS FOR NEXT-GEN ACTIVE SAFETY COMPUTING PLATFORM
Xingang Guo, Intel

1:30 p.m.
CYBER SECURITY ISSUES AND CHALLENGES FOR LONG TERM DEPLOYMENT OF ACTIVE SAFETY SYSTEMS
Dr. André Weimerskirch, ESCRYP 7 Inc.
2:00 p.m.  
TIME OF FLIGHT CAMERAS: OPTICAL RANGE SENSING FOR SAFETY APPLICATIONS  
Steve Gross, Infineon Technologies North America Corporation

2:30 p.m.  
LEGAL IMPLICATIONS OF LONG-TERM ACTIVE SAFETY TECHNOLOGIES  
Steve Wood, National Highway Traffic Safety Administration

3:00 p.m.  
TEST PROCEDURES TO EVALUATE ACTIVE SAFETY SYSTEMS  
Robert Lange, Exponent Inc.

3:30 p.m.  
NETWORKING BREAK

4:00 p.m.  
SECURITY FOR AUTOMOTIVE SEMICONDUCTORS - PREPARING FOR FUTURE RISKS  
Jeff Kelley, Infineon Technologies North America Corporation

4:30 p.m.  
LESSON LEARNED FROM LEIDOS (FORMALLY SAIC) AND WHAT’S HAPPENING NOW AND IT’S EFFECT ON FUTURE OF ACTIVE SAFETY  
Frank Perry, Leidos

5:00 p.m.  
CONCLUDING REMARKS

SAE INTERNATIONAL JOURNAL OF TRANSPORTATION SAFETY

Our premier safety journal offers scholarly works on all aspects of injury causation and mitigation associated with transportation systems. This includes safety mechanisms, impact, and injury response with the objective of developing environments that are safer for the occupant, rider, passerby, and warfighter. Within the scope of this international journal, you’ll also find comprehensive topics including:

- Biomechanics
- Crashworthiness
- Accident reconstruction
- Physical and computational modeling

Contact us today!  
www.sae.org/journals  
SAE Customer Service  
1-877-606-7323  
1-724-776-4970 (outside U.S. & Canada)  
CustomerService@sae.org
TECHNICAL PROGRAM

THURSDAY
NOVEMBER 7

(See page 12-31 for complete abstract and biography)

UNDERSTANDING HUMAN FACTORS AND CRASH ANALYSIS FOR ACTIVE DRIVE ASSIST SYSTEMS

8:30 a.m.
PLENARY KEYNOTE:
TOYOTA’S APPROACH TO “INTEGRATED SAFETY”
Seigo Kuzumaki, Toyota Motor Corporation

9:00 a.m.
LOW AUTOMATION DEFINITIONS - SOME ISSUES AND CONSIDERATIONS
Dr. Charles Green, General Motors Co.

9:30 a.m.
HMI TO EFFECTIVELY MANAGE WARNINGS: CHANGES IN THE DRIVING TASK AND ASSOCIATED CHALLENGES
Dr. Jim Sayer, University of Michigan Transportation Research Institute

10:00 a.m.
NETWORKING BREAK

10:30 a.m.
USING NATURALISTIC DRIVING DATA TO UNDERSTAND CRASH CAUSATION AND CRASH COUNTERMEASURES ASSOCIATED WITH ACTIVE SAFETY SYSTEMS
Dr. Tom Dingus, Virginia Tech

11:00 a.m.
DRIVER DISTRACTION, DRIVER JUDGMENT, & RISK MITIGATION
Louis Tijerina, Ford Motor Co.

11:30 a.m.
THE USE OF ADVANCED EVENT DATA RECORDERS TO RECONSTRUCT VEHICLE TRAJECTORIES FOR USE IN ACTIVE SAFETY SYSTEMS ASSESSMENT
Dr. Clay Gabler, Virginia Tech. Institute

12:00 p.m.
NETWORKING LUNCH

1:00 p.m.
EVENT DATA RECORDER STANDARDIZATION
Brian J. Everest, General Motors Co.

1:30 p.m.
POST COLLISION BRAKE SYSTEMS: INTRODUCTION AND BENEFIT ESTIMATION METHOD
Thorsten Leonhardt, Audi AG

2:00 p.m.
GRAPHICAL REQUIREMENTS AND VALIDATION TOOL FOR ADAS
Hong Bae, IAV Automotive Engineering Inc.
TECHNICAL PROGRAM

2:30 p.m.
ACTIVE/PASSIVE SAFETY INTEGRATION
Steven M. Kenner, Ford Motor Co.

3:00 p.m.
PANEL DISCUSSION: ACTIVE AND PASSIVE SAFETY INTEGRATION
SCOPE: As we move towards a “safe vehicle” the ability to take information from active safety technologies and integrate that information to enhance the occupant protection performance function. A panel of experts will discuss the various opportunities and applications being developed and the challenges of system integration of these technologies.

Moderator:  Drew Winter, WardsAuto World Magazine

Panelists:  Hideki Hada, Toyota Technical Center
Rob Jones, Bosch
Thorsten Leonhardt, AUDI AG
John McGowan, Infineon

4:30 p.m.
CONCLUDING REMARKS

ACTIVE SAFETY. PASSIVE SAFETY.
LEARN THE LATEST IN THIS CONCISE NEW BOOK

Integrated Automotive Safety Handbook
By Ulrich W. Seiffert and Mark Gonter
Written by two of the foremost automotive engineering safety experts, this book takes a unique and comprehensive approach to describing all areas of vehicle safety and provides a solutions-based perspective of integrated vehicle safety. Chapters include:

• Accident research
• Functions of integrated safety
• Biomechanics and protection criteria
• Injury mitigation
• Adaptive occupant protection, compatibility, calculation and simulation

SAE Member Price: $87.96*
List Price: $109.95
Product Code: R-407
ISBN: 978-0-7680-6437-7
Published: August 2013

*Discount based on Elite Member level. For more information on member levels, visit www.sae.org/membership/benefits.

Available in print, eBook and enterprise multi-user access.

Order today! Visit books.sae.org/book-r-407
Email: CustomerService@sae.org
Actual shipping charges will be applied
OPENING KEYNOTE:
ACTIVE SAFETY SYSTEMS: ITS PROMISES, POSSIBILITIES AND CHALLENGES IN ACHIEVING TOTAL SAFETY
TUESDAY, NOVEMBER 5, 2013, 8:30 A.M.

Dr. Joseph N. Kanianthra is the President of Active Safety Engineering LLC, a company set up specifically to provide automobile safety consulting services to the industry and safety community. He retired from the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation in August 2008 after 32 years of service. There he was the Senior Technical Advisor and an Associate Administrator for the Office of Vehicle Safety Research, where he directed all vehicle safety research related to crashworthiness, crash avoidance, driver-vehicle performance, tire research, driver distraction research, and intelligent technologies research programs.

ABSTRACT
It is a well-known fact that motor vehicle crashes are the leading cause of death among a large group of the U.S. population between the ages of 3 and 33 years. Over the last forty years significant gains have been made in the number of fatalities and serious injuries that occur in motor vehicle crashes. In 2011 the fatalities in motor vehicle crashes stood at 32,367 and were the lowest ever recorded in U.S. history since 1949. However, the 2012 estimates also show that this trend is reversing as the U.S. economy improves over time. Most of the safety gains made in the last several years have been due to the many safety improvements that have come about particularly in occupant protection countermeasures due to design improvements in highways and vehicle restraints and energy absorbing structures, increased seat belt use, improved emergency medical services, airbags for frontal and side crash protection, upper interior impact protection and many other such features, the focus being mostly on passive safety.

WHAT DO REAL WORLD RESULTS SAY ABOUT DRIVERS AND THE DESIGN OF FUTURE DRIVER ASSISTANCE SYSTEMS?
TUESDAY, NOVEMBER 5, 2013, 9:00 A.M.

Adrian Lund is president of the Insurance Institute for Highway Safety (IIHS) and its affiliate, the Highway Loss Data Institute (HLDI). Dr. Lund earned his doctoral degree in Social Psychology from the State University of New York at Buffalo in 1975 and served as an assistant professor in Residence in the Department of Behavioral Sciences and Community Health at the University of Connecticut Health Center from 1974 to 1981, where he researched programs on people’s health activities. Adrian joined IIHS as a Behavioral Scientist in 1981. As senior vice president for research from 1993 to 2001, he directed the development of the Institute’s extensive vehicle testing program. Throughout his career at IIHS, Dr. Lund has participated in a number of government and nongovernmental committees addressing ways to reduce the injuries, fatalities and property damage from motor vehicle crashes. Currently, he serves as a trustee for the Global New Car Assessment Programme (Global NCAP) and is a member of the Society of Automotive Engineers, American Public Health Association and American Psychological Association.

ABSTRACT
New technology increasingly allows drivers to “know” where they are and their relationships to other vehicles. Drivers also are becoming more connected to the world beyond their cars and the road. Whether these technological trends prevent crashes or make driving chaotic depends on how and whether drivers integrate new information into their driving. In the US, crash risk has not increased as drivers’ use of electronics has increased nor are all crash avoidance systems having the expected benefits. These results raise questions about driver behavior and how new technology and old (think roundabouts) can be utilized to make driving safer.
Lex Kerssemakers was born in the Netherlands in 1960 and grew up in Eindhoven, the home of both DAF and Philips. In 2000, he became head of Product and Business Strategy, based in Sweden. Lex Kerssemakers was the first non-born Swede to take charge of Product Planning at Volvo Cars. After two years, Product Planning and Global Marketing were merged under the title of Global Marketing. A new unit, Brand, Business & Product Strategy, was established after another two years, in summer 2004, with Lex as head. In his new role, he was also appointed Senior Vice President and a member of the Volvo Cars executive management group. Lex Kerssemakers’ role was to continue to develop Volvo Cars’ business by focusing on the company’s core values, competitive advantages and business concepts. Product offers should be tailor made for each customer to the maximum possible extent. For the last two years (2008-2010) he has been President for Volvo Car Overseas Corporation

---

**ACTIVE SAFETY TECHNOLOGIES - STRATEGY FOR MEETING GOAL OF ZERO FATALITIES**

**TUESDAY, NOVEMBER 5, 2013, 9:30 A.M.**

**ABSTRACT**

All major studies indicate that human error plays a major part in the causation of motor vehicle crashes. The studies usually indicate somewhere between 90 to 95% of the crashes where human error is a part of or as the sole cause of the crash. Reducing or eliminating the role of human error in causing crashes must therefore be a top priority in the way forwards towards target of zero fatalities. In 2007, Volvo Cars adopted its Vision 2020. The target of this vision is that, by 2020, no occupants are seriously injured or killed in a new Volvo. Volvo’s strategy is to have systems covering all stages of potential conflicts from driver drowsiness, through lane keeping aid, to systems that act autonomously and brake or steer in order to avoid a crash. The presentation will include the company’s experiences of active safety systems gained so far, including the benefits and the planned next steps, both in the near future and in the more distant future and its projections for autonomous driving technologies.

---

**CURRENT STATE OF TRANSITION FROM ASSISTANCE TO AUTONOMY (AN OEM PERSPECTIVE)**

**TUESDAY, NOVEMBER 5, 2013, 10:30 A.M.**

**ABSTRACT**

Interest in the promise of technologies which assist drivers both in avoiding crashes and in automating aspects of driving itself continues to grow. The idea of autonomously driven cars is not new, but the possibility is becoming more apparent to consumers as new technologies are becoming available in the market, and also as examples of future autonomous capability are appearing in media demonstrations. Progress is being made at a rapid rate, and such systems are likely to be real someday, however there are challenges that must be overcome as we transition to autonomy. This paper will review some of the key transitions that will take place as vehicles progress from today’s systems to systems that are more capable of making driving decisions for the driver, using OEM examples.
Mr. Engelman joined Ford Motor Company in 1992 after completing his engineering studies at The Ohio State University. He has worked on driver assistance and active systems for the last 18 years and has been directly involved in product development for Jaguar, Land Rover, Volvo, Lincoln and Ford products. During this time he has worked on active safety and driver assistance features over the entire product development spectrum from conceptual research to product launch. After completing the last 6 years launching Adaptive Cruise Control, Forward Collision Warning and Collision Mitigation systems on Ford and Lincoln products, Mr. Engelman has returned to the research community at Ford to begin working on the next phase of driver assistance systems.

ABSTRACT
Ford Motor Company has a long history in driver assist and active safety design and implementation focused on enhancing real world functionality for the mass market with exceptional value. This presentation will look at the many driver assistance features available on Ford Motor Company’s current vehicles, as well as discuss elements of the design, development and implementation process for driver assist and active safety technologies. In particular, an overview of Forward Collision Warning with Brake Assist will be used to highlight attributes contributing to feature performance and customer acceptance. Finally a general framework for considering individual vehicle design elements in the context of real world functionality will be presented.

MEETING THE DATA NEEDS FOR FUTURE SAFETY
TUESDAY, NOVEMBER 5, 2013, 11:30 A.M.

Augustus “Chip” Chidester is the Director, Office of Data Acquisitions at National Highway Traffic Safety Administration (NHTSA) where he provides executive leadership in the planning, design, development, coordination, and management of national networks of motor vehicle traffic crash research and data collection activities.

Mr. Chidester has been involved in crash investigation since 1977. Prior to becoming the Director, Office of Data Acquisitions, he served as the Chief of NHTSA’s Crash Investigations Division, Team Leader of the Special Crash Investigations Program, and has also served as a crash investigations specialist for both the NASS and SCI programs.

ABSTRACT
The presentation will cover our current and planned motor vehicle traffic crash data collection efforts. Discussion will include technologies we are researching to enhance our efficiencies in data collection; the relative precision of various data sources related to the collection of crash causation data; the current status of Event Data Recorder (EDR) collection in NHTSA’s crash data collection programs including availability, acquisition, coding and practicality for research; and what we still anticipate as the “gaps” in the future data and suggestions to how industry can assist in acquiring these valuable information.
NISSAN’S TECHNOLOGIES BASED ON SAFETY SHIELD CONCEPT
TUESDAY, NOVEMBER 5, 2013, 1:00 P.M.

Andy Christensen is senior manager, Technology Planning and Strategic Technology Communication, Nissan Americas Research and Development (R&D). He is responsible for technical communications of Nissan active safety and autonomous vehicle technologies, leading Nissan’s involvement in technology standardization activities related to electric vehicles and leading Nissan’s R&D innovation initiative to expand advanced development capabilities in the U.S.

Among other key projects, Christensen led a team that developed the Nissan LEAF Vehicle Sound for Pedestrians, oversaw Nissan’s participation in Connected Vehicle Research with the U.S. Department of Transportation and spearheaded the company’s role as Host Company of the 2012 SAE World Congress.

Christensen earned a bachelor’s in Mechanical Engineering from General Motors Institute (now Kettering University). He is based at Nissan Technical Center North America in Farmington Hills, Mich.

ABSTRACT
Active safety technologies are expected to reduce the number and damage of accidents. Nissan has been working to introduce and enhance active safety technologies based on Safety Shield Concept which aims to realize vehicles that help protect people by multiple layered shields from various risks surrounding the vehicle. This presentation introduces accident analysis to identify potentially effective technologies in each layer and touches on the feature and configuration of each technology and possible applications in near future which are expected to be the basis of semi-autonomous system.

TOYOTA’S ACTIVE SAFETY SYSTEM STRATEGY
TUESDAY, NOVEMBER 5, 2013, 1:30 P.M.

Yukihiro Ikeda is a project manager of safety technology planning division in Toyota Motor Corporation and mainly in charge of active safety. He received the B.S. degree in 1990 and the M.S. degree in 1992 from Hokkaido University of Nuclear safety engineering, Hokkaido, Japan. He joined Toyota Motor Corporation in April 1992 and was a design engineer of ABS/VSC actuator until 1999. From 1999 to 2002, he worked for G-BOOK project which was the first Toyota telematics system. From 2003, he started pre-development using Navigation system in order to enhance vehicle safety and comfort and in 2008, he launched driver assist system at intersection with stop signal using Navigation with high map accuracy in Japan market. From 2009, he was a General Manager of Electronics Engineering division in Toyota Motor Europe R&D, Belgium and managed regional Multimedia system and chassis related ECU development. He also worked for technical research, benchmarking activity and conformity test of Toyota vehicles for active safety system in Europe until December 2012. Now he is a member of some JAMA working group.

ABSTRACT
Toyota Motor Corporation is always working for the technology development targeting the ultimate goal which is zero fatalities by traffic accident. In addition to passive safety (crash worthiness) technology, recently active safety (collision avoidance) technology is focused on because active safety is expected to have certain potentials to reduce accidents. It is important to keep dangerous situation away by helping driver’s cycle of “recognition”, “judgment” and “operation” as much as possible in case of supporting him to avoid the traffic accidents. Toyota has introduced PCS (Pre-Collision System) into the market in 2003, continuously improved it since then and introduced some other advanced active safety systems based on the concept of “Integrated Safety”. This presentation presents the aim and structure of those active safety systems and indicates future direction of technology development.
INTEGRATED SAFETY - OPPORTUNITIES, CHALLENGES AND NEEDS FOR THE NEXT GENERATION OF VEHICLE SAFETY
TUESDAY, NOVEMBER 5, 2013, 2:00 P.M.

Dipl.-Ing. Klaus Kompass is Vice President Vehicle Safety at BMW Group in Munich, Germany. Klaus Kompass came to BMW in 1986 as crash test engineer after receiving his diploma in safety engineering from the University of Wuppertal, Germany.

In 2008 Mr. Kompass became the Vice President Vehicle Safety for the BMW Group including the brands BMW, Rolls-Royce and Mini. In this role he is responsible for all crash test facilities, the development of active and passive safety as well as the accident research teams in Germany and the US. He received the Airbag-Award from Fraunhofer Gesellschaft in 2004. As a adjunct professor he teaches active safety and driver assistance systems at the Technical University Berlin since 8 years. In 2013 he received the U.S. Government Award for Safety Engineering Excellence for his exceptional scientific contributions in the field of automotive safety engineering.

ABSTRACT

The development of passive safety reached a very high level. Further improvement of vehicle safety can only be achieved by combining passive with active safety – this leads to the BMW integrated safety approach. An example is the safety for pedestrians. Higher requirements for passive pedestrian safety lead to more weight and CO2 emissions with rather limited effects for safety. Active systems for mitigation or even avoidance have the highest potential for the safety of pedestrians. Main challenges are the system design of scenario detection and interpretation. A precondition for a quick market introduction is the worldwide harmonization of assessment requirements.

PRE-COLLISION SYSTEM PERFORMANCE EVALUATION
TUESDAY, NOVEMBER 5, 2013, 2:30 P.M.

Rini Sherony is a Principal Engineer at Toyota’s Collaborative Safety Research Center (CSRC) which is part of Toyota Technical Center located in Ann Arbor, Michigan. She is with Toyota for the past 15 years working in crash data analysis, Active Safety system design, evaluation and planning. Rini has a Master’s degree in Electrical Engineering. At CSRC She is the lead for active safety collaboration research and crash data analysis. Her current responsibilities include development of test procedures, surrogate target, and testing for active safety systems like Pre-Collision, Pedestrian Pre-Collision system, etc. She is an active member of the SAE Active Safety committee. She is also a member of the Institute of Electronics and Electrical Engineers (IEEE) and the Association for the Advancement of Automotive Medicine (AAAM).

ABSTRACT

This presentation describes the development of test scenarios from real world crash data, a new surrogate target representative of real world vehicles involved in rear-end crashes and evaluation results of Pre-Collision System (PCS) that include crash imminent braking and dynamic brake assist functions. The test scenarios were developed using rear-end crash data from NHTSA’s General Estimate System and Crashworthiness Data System (including Event Data Recorder). The 77GHz radar reflection characteristics of the surrogate target was addressed using radar scan results of 25 actual vehicles at numerous angles. Finally the performance of two different PCS equipped vehicles was evaluated using the surrogate target at test track testing.
ACTIVE SAFETY VIA SIMULATION: PAST, PRESENT AND (PREDICTING THE) FUTURE
TUESDAY, NOVEMBER 5, 2013, 3:00 P.M.

Dr. Elwell has worked for Kelsey Hayes (now TRW Automotive) ever since. Hired to advance Hardware-in-the-Loop vehicle simulation, he is manager of the TRW ‘SimLab’. The lab contains 14 ‘simbucks’ representing individual vehicle platforms, each containing a vehicle braking system. He received a TRW “Trade Secret Award” in lieu of a patent for an original real-time simulation design. He is the primary vehicle dynamics modeler and recognized analytical expert in the company, working with numerous vehicle manufacturers and travelling globally. He is currently a reviewer for an ASME journal and a happily married father of 6 children. Dr. Elwell graduated from the University of Utah in 1994 with a Ph.D. in vehicle & trailer dynamics and control.

ABSTRACT
TRW Automotive has used both desktop and HIL (hardware-in-the-loop) simulation and simulation automation effectively for many years. Originally as Kelsey-Hayes and then for a few years as LucasVarity, NHTSA Vehicle Automation Level (1) technologies like ESC have been successfully developed in both North America (Livonia, MI) and Europe (Koblenz, Germany) with the help of simulation since the 90’s. In one recent example, TRW used HIL simulation and automation to meet the ECE (European) governmental requirements for TRW’s rollover prevention technology embedded within its ESC system produced for a Japanese truck OEM. This testing and prove-out encompassed simulating nearly 100 buildable combinations, with multiple loadings using multiple driving scenarios on 2 surfaces. Thousands of HIL simulations were necessary. The simulation automation was absolutely necessary for this level of subsystem validation to occur. Going forward, then, companies must recognize that future system validation needs will not only require simulation, but also simulation automation due to the vast number of tests that are necessary; therefore, simulation automation (in whatever form) will quickly become a technological necessity. The current challenge of using simulation to reduce the number of development vehicle builds and/or in-vehicle development is also currently underway in the automotive industry (typically at OEM and Tier 1 levels).

SUPPLIER VIEW OF ACTIVE SAFETY
TUESDAY, NOVEMBER 5, 2013, 4:00 P.M.

Speaker TBD

NOTES
EXPERT PANEL DISCUSSION: INFRASTRUCTURE, TEST BED AND IMPLEMENTATION (TEST PERFORMANCE)
TUESDAY, NOVEMBER 5, 2013, 4:30 P.M.

Moderator:

John Maddox
Director of Collaborative Program Strategies
Texas Transportation Institute

John Maddox serves as the Director of Collaborative Program Strategies at both UMTRI and TTI. In this position, he develops collaborative research strategies, initiatives and opportunities for both organizations with federal/state agencies and industry stakeholders and other partners to tackle significant problems in transportation safety, the environment, and mobility that can be addressed only through collaborative research.

Panelists:

Matthew J. Avery
Head of Research
Motor Insurance Repair Research Centre

As Head of Research at Thatcham, Matthew’s current role involves liaison with vehicle manufacturers, legislators and global NCAP initiatives in all aspects of crash testing, with a view to encouraging safer designs and more cost effective vehicle repair.

Matthew has led much of Thatcham’s research work into whiplash testing. He co-authored the international insurance seat assessment procedure, now used as the basis for the Euro NCAP whiplash test and also advises on whiplash issues within the European legislative framework. He also chairs various working groups within the crash test community.

Anders Eugensson
Researcher
Volvo Cars of North America LLC

Anders Eugensson received his Master Degree in Civil Engineering from Chalmers University of Technology, Gothenburg, Sweden and Imperial College, London, England in 1978.

Since the beginning of 2003 he is the Director of Governmental Affairs within Volvo Car Corporation. In this role he is part of the cross-functional team responsible for defining the long-term Volvo Cars safety strategies.

Richard Schram
Technical Manager & Chairman
Euro NCAP

Richard Schram, MSc. (1980) studied at the Eindhoven University of Technology in the Netherlands.

Since 2010, Richard is Technical Manager of the European New Car Assessment Program in Brussels, Belgium. He is the Chairman of the Primary NCAP Technical Working Group of Euro NCAP, responsible for the development of all active safety test and assessment protocols.

David S. Zuby
Chief Research Officer
Insurance Institute for Highway Safety

David Zuby is chief research officer for the Insurance Institute for Highway Safety. Working out of the Vehicle Research Center (VRC), he oversees and coordinates research by the VRC, the Institute research department in Arlington and the Highway Loss Data Institute.

Mr. Zuby is the author of numerous research papers published by the Institute on topics such as the biomechanics of injury, pedestrian protection, crashworthiness and crash investigation.
PLENARY KEYNOTE:  
LONG TERM VIEW OF ACTIVE SAFETY AS SEEN BY GOOGLE  
WEDNESDAY, NOVEMBER 6, 2013, 8:30 A.M.

Anthony Levandowski is the product manager for Google’s self-driving car technology. Anthony joined Google to launch Streetview in 2007. Prior to that he founded 510 Systems, a developer of mobile mapping and surveying technology. Notable robots include ghostrider, an unmanned motorcycle now in the smithsonian and pribot, an unmanned prius used to deliver pizza in San Francisco. He has an MS and BS from UC Berkeley in Industrial Engineering and Operations Research.

TECHNOLOGIES AND TOOLS FOR THE DEVELOPMENT AND TEST OF ACTIVE SAFETY SYSTEMS  
WEDNESDAY, NOVEMBER 6, 2013, 9:00 A.M.

Vivek Moudgal is the Director of Sales for dSPACE, Inc., responsible for sales operations in the company’s North American market. Vivek joined dSPACE in 1993 as a technical support engineer and progressed into an Engineering management role overseeing product support, training, and application engineering services. In 2003, Vivek took on Sales responsibility for dSPACE’s North American operations, after receiving a MBA from the University of Michigan, Ross School of Business. Throughout his tenure with the company, he has gained expertise in the application of model-based development tools for control software development and validation.

ABSTRACT
Active safety systems are gaining importance in the automotive area. Based on the well-established V-cycle, this presentation will introduce a tool chain for the development and test of active safety systems. Emergency brake assistant and lane departure warning, serve as examples to outline how safety systems can be tested in a virtual traffic environment on a PC by means of model-in-the-loop simulation. It is shown how the same tool chain, comprising the simulation models, tests and the framework for automating and visualizing test scenarios, is reused for validating production ECUs with hardware in-the-loop simulators or to perform test drives (prototyping).

NOTES
EVOLUTION FROM ASSISTED TO AUTOMATED DRIVING
WEDNESDAY, NOVEMBER 6, 2013, 9:30 A.M.

Holger Schanz recently took over the new responsibility of Senior Manager for Advanced Technology and Innovation in 2012, within Continental’s Advanced Driver Assistance Systems (ADAS) business unit in North America, located in Auburn Hills MI. With his deep knowledge of ADAS technologies, he is responsible to spearhead Continental’s ADAS advanced technology and innovation development with focus on the North American market. Mr. Schanz has worked within Continental’s ADAS group since 1998, after receiving his Diploma Degree in Electrical Engineering from the University of Ulm (Germany), in the area of radar systems and radio communication. Before taking over his recent role, he came to the US end of 2010 to take over the lead of Continental’s ADAS North American R&D group, after staying at Continental’s Japan headquarters in Yokohama for about 5 years to build up Continentals ADAS R&D group in Japan.

ABSTRACT
An insight in how Continental perceives and approaches the development from assisted to automated driving.

NOTES
SPEAKER BIOGRAPHIES AND ABSTRACTS

EXPERT PANEL DISCUSSION: OEM PERSPECTIVE ON MASS DEPLOYMENT STRATEGIES
WEDNESDAY, NOVEMBER 6, 2013, 10:30 A.M.

Moderator:

**Gerry Conover**
Managing Director
PRC Associates

Gerald Conover is a world-renowned expert on intelligent transport systems and services. As managing director of PRC Associates, Mr. Conover continues to apply his broad ITS experience and expertise to solve the problems of, and create new opportunities for, companies and public agencies in the ITS community. His specialties are management consulting and strategic planning.

His particular expertise is ITS systems and service business and product analysis, product strategy and plans, and globalization.

Panelists:

**John P. Capp**
Director
Electrical & Control Systems Research
and Active Safety Strategic Lead
General Motors R & D

(See page 21 for complete Biography)

**Christian Schumacher**
Head of Advanced Driver Assistance Systems, NAFTA Continental Automotive Systems

Christian Schumacher is the regional head of Advanced Driver Assistance Systems for Continental Automotive Systems N.A., a position he has held since May 1st, 2012. In this capacity, Schumacher is responsible for all activities in North American Region for this Business Unit.

**Hideki Hada**
General Manager
Integrated Vehicle Systems Department
Toyota Motor Engineering & Manufacturing North America

Hideki Hada is in charge of technology planning for intelligent transportation systems (ITS) and active safety systems at Toyota Technical Center. Utilizing his rich experience in the strategy development and industry analysis, Hada focuses his work at Integrated Vehicle Systems Department to identify the technical domains that Toyota should pursue further research and development efforts in the North American region. He also serves as the project manager for a government-industry collaboration project to develop infrastructure-cooperative collision avoidance technologies. Hada’s goal in automotive research is to find a balanced social and technological solution with maximum safety and mobility. His previous responsibilities include HMI research, government affairs, technology benchmarking, electronics design coordination, and technology planning.

**Kay Stepper**
Director, Driver Assistance Systems Chassis Systems Control
Robert Bosch LLC

Dr. Kay Stepper is Head of the Regional Business Unit and Director of Engineering for Driver Assistance Systems for the Chassis Systems Control division of Robert Bosch LLC in Plymouth, Michigan.

**David S. Zuby**
Chief Research Officer
Insurance Institute for Highway Safety

(See page 18 for complete Biography)

SAE 2013 Active Safety Systems Symposium 21
SYSTEM ROBUSTNESS FOR NEXT-GEN ACTIVE SAFETY COMPUTING PLATFORM
WEDNESDAY, NOVEMBER 6, 2013, 1:00 P.M.

Xingang Guo is a Senior Principal Engineer, and Director of the Integrated Solutions Lab at Intel Labs. He leads the advance research efforts in bringing consumer oriented solution focus to deeply embedded systems for automotive safety, infotainment, retail operation, mobile communication and pervasive computing. His research interests include embedded system and software, wireless and optical communication systems and application and services, computer vision, robotics and machine learning. He received Ph.D. in computer science from the University of Texas at Austin, and Bachelor’s degree from the Tsinghua University in Beijing.

ABSTRACT
The rapid evolution of active safety systems is leading to an increasingly automated and autonomous driving. Next-generation active safety systems will need to support high performance, sophisticated, often undeterminstic, and specialized computation on cost-effective computing platforms. It is of paramount importance that such platforms are capable of handling errors during computation, recovering, and continuing to perform safety-critical missions. This talk will present a systematic approach to system robustness that combines innovations in circuit design, hardware architecture, and virtualization technology.

CYBER SECURITY ISSUES AND CHALLENGES FOR LONG TERM DEPLOYMENT OF ACTIVE SAFETY SYSTEMS
WEDNESDAY, NOVEMBER 6, 2013, 1:30 P.M.

Dr. Weimerskirch is CEO of ESCRYPT Inc. and is in charge of the international activities of ESCRYPT. Previously, Dr. Weimerskirch was with several renowned companies in the areas of research, development, and consulting including Accenture, Deutsche Post, Philips Research, and Sun Labs.

He is an internationally known expert in the area of embedded, industrial and vehicle data security and privacy. Andre is a main actor in the definition of the vehicle-to-vehicle communication security and privacy mechanisms both in USA and Europe. He is also active in the area of secure automotive infotainment systems and secure computing platforms. Andre received his Master of Science in computer science at Worcester Polytechnic Institute, USA, and then a PhD of Ruhr-University of Bochum in the area of applied data security.

ABSTRACT
Modern vehicles are increasingly equipped with electronic systems to improve safety and comfort of passengers. The use of more complex electronic systems comes at the cost of an increased vulnerability to hacker attacks to potentially endanger integrity of safety systems. This presentation will present challenges and solutions around automotive cyber security to protect vehicle safety systems. Security mechanisms, such as secure software flashing, secure diagnosis, secure communication and protection of wireless and wired interfaces, will be presented.
TIME OF FLIGHT CAMERAS: OPTICAL RANGE SENSING FOR SAFETY APPLICATIONS  
WEDNESDAY, NOVEMBER 6, 2013, 2:00 P.M.

Steve Gross is a Technical Marketing Manager with Infineon Technologies North America, with responsibility for several sensor technologies including time of flight cameras. He has over 20 years of experience in sensor and signal processing products and systems, for employers including the University of Michigan, Michigan State University, and TRW Automotive. He is a proud alumnus of Michigan State University, where he received BS and MS degrees in engineering and an MBA.

ABSTRACT
Optical range sensing with time of flight cameras is gaining a foothold as a human interface technique in consumer applications. But it also brings many benefits for automotive safety. For example, inside the car gesture control can give the driver “eyes on the road” control of navigation, HVAC, and infotainment systems. Range sensing can also improve passenger classification, detect hand position on the steering wheel, and even identify drowsy drivers by head position. Outside the car, time of flight cameras can be used for autonomous parking, cross-traffic alerts, and forward-looking pedestrian protection. In this session, we will focus on the hardware and software components needed to address these applications effectively.

LEGAL IMPLICATIONS OF LONG-TERM ACTIVE SAFETY TECHNOLOGIES  
WEDNESDAY, NOVEMBER 6, 2013, 2:30 P.M.

Stephen Wood is the Assistant Chief Counsel for Vehicle Rulemaking and Harmonization at the National Highway Traffic Safety Administration. He directs the drafting of rulemaking notices regarding U.S. vehicle standards and product rating and labeling regulations on safety and fuel economy. He leads efforts to ensure their defensibility and enforceability. Current priorities include addressing legal issues related to the potential regulation of autonomous or automated vehicles and “connected” vehicles.

NOTES
TEST PROCEDURES TO EFFECTIVELY EVALUATE ACTIVE SAFETY SYSTEMS  
WEDNESDAY, NOVEMBER 6, 2013, 3:00 P.M.

Mr. Robert C. Lange is a Principal and Group Vice President for Exponent. Mr. Lange has almost 40 years experience in automotive engineering, specializing in motor vehicle safety and public health.

Academic Credentials and Professional Honors
M.S., Mechanical Engineering, University of Michigan, 1975
B.S., Mechanical Engineering, University of Michigan, 1969

ABSTRACT
The past 50 years of motor vehicle safety have registered significant reductions in the injury and fatality rate consequent to motor vehicle collisions. Motor vehicle safety researchers and practitioners are increasingly focused on collision avoidance technologies as offering great potential for continued progress in reducing collision related injury.

SECURITY FOR AUTOMOTIVE SEMICONDUCTORS - PREPARING FOR FUTURE RISKS  
WEDNESDAY, NOVEMBER 6, 2013, 4:00 P.M.

Jeff Kelley joined the Automotive Group of Infineon Technologies in 2002, and has worked in power electronics, microcontroller, sensors, safety, ASIC and security business segments for the company. Previously, he was director of power marketing for National Semiconductor and a marketing manager at ST Microelectronics. A Michigan native, Jeff earned his BS in Electrical and Computer Engineering from the University of Michigan.

ABSTRACT
In this presentation, we will review the context and the actual use cases of automotive security. This basis will then serve to describe the typical security architecture that will provide protection to the automobile within its environment. Finally, we will highlight solutions from this architecture, which are readily available or road mapped to be integrated within the upcoming automotive platforms.

NOTES
LESSON LEARNED FROM LEIDOS (FORMALLY SAIC) AND WHAT’S HAPPENING NOW AND IT’S EFFECT ON FUTURE OF ACTIVE SAFETY
WEDNESDAY, NOVEMBER 6, 2013, 4:30 P.M.

Mr. Frank Perry of Leidos (formally SAIC) has over 20 years of experience in wireless network design, deployment, optimization, and operation, 6 years of light duty vehicle systems experience, and 9 years of Connected Vehicle experience. He deployed, tested, and operated the original USDOT Connected Vehicle Test Bed in Novi Mi. Mr. Perry lead the device interoperability testing for the USDOT Safety Pilot Model Deployment project, designed and will integrate of the City of Detroit Connected Vehicle Test Bed for the 2014 ITS World Congress, and is responsible for the evolution of the USDOT Michigan Test Bed as the standards are updated and new devices are deployed.

ABSTRACT
This presentation will discuss lessons learned from the USDOT Safety Pilot conducted in Ann Arbor from a DSRC device Interoperability Testing perspective along with current Connected Vehicle efforts as a result of the Safety Pilot and other Connected Vehicle Projects. The presentation will conclude with a section discussing how recent connected vehicle project and findings could affect the future of Active Safety.

PLENARY KEYNOTE:
TOYOTA’S APPROACH TO “INTEGRATED SAFETY”
THURSDAY, NOVEMBER 7, 2013, 8:30 A.M.

Mr. Kuzumaki has been the Chief Safety Technology Officer Secretary, working in safety technology planning group at Toyota Motor Corporation since 2011. His role is strengthening vehicle safety performance in Toyota. He has a master degree in aeronautical engineering from Kyoto University. He joined Toyota Motor Corporation in 1985. And he received a special award of appreciation from U.S. Government in ESV 2007.

ABSTRACT
Various safety technology developments including collision safety have been conducted for traffic fatalities reduction. For more reduction, especially for vulnerable road user’s safety, active safety technologies have a great potential to contribute. Autonomous emergency brake system could be able to reduce pedestrian or cyclist accidents, and automated driving technology will be applied to driving support systems which can help compensating elderly drivers for his or her decay in driving abilities. In the presentation, Toyota’s approach to Integrated Safety and our latest technologies will be shown.

NOTES

---

SPEAKER BIOGRAPHIES AND ABSTRACTS
LOW AUTOMATION DEFINITIONS - SOME ISSUES AND CONSIDERATIONS
THURSDAY, NOVEMBER 7, 2013, 9:00 A.M.

Dr. Charles A Green is the Global Lead for Driver Performance Studies in Active Safety at General Motors. He received his B.S. in Mechanical Engineering from University of Illinois in Champaign, and then his M.S. and Ph.D. in Industrial Engineering – Human Factors from Virginia Tech. Following some years working on Human Factors and Usability issues in the Telecommunications and Wireless Internet industries, Chuck has spent the last 12 years at GM developing driver performance-related Active Safety system requirements for such features as Rear Vision, Rear Automatic Braking, Full Speed Range Adaptive Cruise Control, Lane Keeping Assist, and SuperCruise. Chuck also develops driver performance related information to assist in Safety Critical Systems evaluation.

ABSTRACT
Automation definitions may become important in near-term vehicle development because they determine what vehicle features may be in scope of upcoming standards, regulations or law regarding testing and/or sale of the technology. The NHTSA has recently released guidance definitions of various levels of vehicle automation, and other organizations are also drafting definitions, including SAE, ISO, OICA, Germany’s VDA and several US state legislatures. Definitions that include references to “monitoring” are important for driver behavior in NHTSA’s “Level 2” and “Level 3” levels of automation, and could impact nearer term production of “Level 2” systems. In most definitions, “Level 2” automation differs from “Level 3” automation in the amount of monitoring by the driver required, yet even with no automation, drivers do not provide constant visual attention to the driving task. Separation of performance between “Level 1” and “Level 2” automation also merits further consideration as separating steering automation for specific driving events, versus continuous control of steering to maintain lane position, may affect driver’s propensity to exhibit different behaviors.

HMI TO EFFECTIVELY MANAGE WARNINGS: CHANGES IN THE DRIVING TASK AND ASSOCIATED CHALLENGES
THURSDAY, NOVEMBER 7, 2013, 9:30 A.M.

Dr. Jim Sayer is a Research Scientist, and Head of the Human Factors Group, at the University of Michigan Transportation Research Institute where he has conducted both basic and translational research in the areas of driver assistance and advanced safety systems development, naturalistic driving behavior, driver distraction, driver vision, and pedestrian conspicuity since 1993. He currently serves as the Project Manager of the Connected Vehicle Safety Pilot Model Deployment, a U.S. Department of Transportation-sponsored program to demonstrate connected vehicle technologies in a real-world, multi-modal environment. The results of the Safety Pilot Model Deployment are being used by the U.S. DOT to determine driver acceptance for, and evaluate the feasibility, scalability, security and device interoperability of connected vehicle technologies.

ABSTRACT
With the wide variety of technological advances being introduced into motor vehicles, and far more significant advances on the horizon, the role of the driver, and hence the driver-vehicle interface (DVI), is likely to change radically. With the promise of increasing levels of automation will come increasing challenges to convey not only the state of the vehicle, but also when – and how – drivers are expected to be directly engaged in the vehicles’ control. Getting from the current state of vehicle automation to a fully automated vehicle poses significant and exciting challenges, particularly in the design of safe and effective DVIs. This presentation will examine levels of vehicle automation, and discuss DVI challenges, associated with each level.
USING NATURALISTIC DRIVING DATA TO UNDERSTAND CRASH CAUSATION AND CRASH COUNTERMEASURES ASSOCIATED WITH ACTIVE SAFETY SYSTEMS
THURSDAY, NOVEMBER 7, 2013, 10:30 A.M.

Thomas A. Dingus is Director of the Virginia Tech Transportation Institute and the Newport News Shipbuilding Professor of Engineering at Virginia Tech. Dr. Dingus has conducted transportation safety and human factors research since 1984, including the safety and usability of an advanced in-vehicle devices, crash avoidance countermeasures, truck driver fatigue, and driver distraction and attention. Dr. Dingus is a Fellow of the Human Factors and Ergonomics Society from which he has received several awards, including the A.R Lauer Award career achievement award for outstanding contributions to the field of safety. He has had the honor of receiving an award from the White House as a “Champion of Change” in transportation safety, as well as testifying before a U.S. Congressional sub-committee (three times). Dr. Dingus has over 220 technical publications and has managed over 250 million dollars in research funding thus far in his career.

ABSTRACT
Naturalistic driving research has enabled the analysis of driving safety at a level that has previously been unattainable. Instrumentation packages with multiple camera and other sensors have been installed on 1,000s of personal light vehicles, commercial trucks and motorcycles. As a result, very large datasets with 10’s of millions of miles of driving are now coming online that allow us to analyze crashes, near crashes, and other safety critical events in great detail. This presentation will discuss the data that are available, and provide several example analyses that specifically address the effectiveness of active safety systems.

DRIVER DISTRACTION, DRIVER JUDGMENT, & RISK MITIGATION
THURSDAY, NOVEMBER 7, 2013, 11:00 A.M.

Louis Tijerina joined Ford Motor Company in 1999 to conduct research on driver distraction and driver warning systems. Previously, he spent 4 years at NHTSA’s Vehicle Research and Test Center where he co-authored NHTSA’s first comprehensive report on cell phones and highway safety. Before that, he spent 11 years at the Battelle Memorial Institute working on problems in transportation and defense. He holds an M.S. in industrial engineering and a Ph.D. in experimental psychology, both from the Ohio State University. He currently serves on the editorial board of the journal Human Factors and is a member of the TRB Committee on Road User Characteristics.

ABSTRACT
In recent years, a great deal has been learned about driver distraction as it relates to real-world safety. This new knowledge is due to large-scale, government-sponsored, naturalistic driving studies. This presentation will review recent crash trends and key findings and talk about practical aspects of driver cognition that might help explain this recent data. The presentation will introduce examples of a new, evolving area of naturalistic driving research that complements an understanding of how drivers get into trouble with research into how drivers stay out of trouble the vast majority of the time. The presentation will conclude with some suggestions on how the combination of these factors might guide active safety and driver assistance systems enhancements in the future.
THE USE OF ADVANCED EVENT DATA RECORDERS TO RECONSTRUCT VEHICLE TRAJECTORIES FOR USE IN ACTIVE SAFETY SYSTEMS ASSESSMENT
THURSDAY, NOVEMBER 7, 2013, 11:30 A.M.

H. Clay Gabler, Ph.D. H. Clay Gabler is a Professor of Biomedical Engineering at Virginia Tech. He is the Associate Department Head of Graduate Studies in Biomedical Engineering and serves as an Associate Director of the Center for Injury Biomechanics. Prior to accepting an appointment at Virginia Tech in 2005, Dr. Gabler served as a research program manager at the U.S. National Highway Traffic Safety Administration and a faculty member of the Mechanical Engineering department at Rowan University. Dr. Gabler received his Ph.D. in Mechanical and Aerospace Engineering from Princeton University. Dr. Gabler has active research programs underway in active safety systems, vehicle crashworthiness, injury biomechanics, advanced occupant restraint performance, and event data recorders. To date, he has published over 150 technical papers and a book in these areas of research.

ABSTRACT
Safety Impact Methodologies (SIMs) have the goal of estimating safety benefits for proposed active safety systems. Because the pre-crash movements of vehicles involved in real-world crashes are often unknown, previous SIMs have taken the approach to reconstruct collisions from incomplete information sources, such as scaled scene diagrams and photographic evidence. The objective of this study is to introduce a novel methodology for reconstructing the pre-crash vehicle trajectories using data from advanced Event Data Recorders (EDRs).

EVENT DATA RECORDER STANDARDIZATION
THURSDAY, NOVEMBER 7, 2013, 1:00 P.M.

Mr. Everest has twenty-nine years in the auto industry, twenty-four with General Motors. He is a Senior Consultant & Manager within GM’s Interior and Safety Department. His duties involve managing the Airbag and Crash Reconstruction Group, providing engineering analysis of the field performance of vehicle restraint systems & air bags, and assisting General Motors Legal Staff in the technical assessment of airbag claims. He has experience using EDR field data since 1996.

Mr. Everest has been an SAE International member for 17 years. He was a member of the Vehicle Event Data Interface Committee and currently Chairs the Event Data Recorder Committee. Within that committee he Chairs the Electronic Control Unit Task Forces and participates on the Update J1698 and Future Parameters Task Forces.

ABSTRACT
In some form, the Event Data Recorder (EDR) function in light duty vehicles has been around for over 20 years. EDR will be a critical component in analyzing active safety systems. Due to the amount of electrification and computer control, EDR data will be an important analytical tool in understanding system and vehicle performance. The Society of Automotive Engineers (SAE) EDR Committee recently published an updated recommended practice for EDR parameters, testing and tools to read the data. The presentation will provide the current and future state for the recommended practice and how it relates to the National Highway Traffic Safety Administration’s “EDR Rule”, 49 CFR Part 563.
POST COLLISION BRAKE SYSTEMS: INTRODUCTION AND BENEFIT ESTIMATION METHOD  
THURSDAY, NOVEMBER 7, 2013, 1:30 P.M.

Thorsten Leonhardt is currently responsible for the department of international vehicle safety in foreign markets and locations. This includes the coordination of global safety matters with among all development locations and relevant safety system engineering teams. Moreover, Thorsten is responsible for the communication of new requirements for active and passive safety to system engineering teams, with specific focus on global consumer assessment programs.

Thorsten studied physics and mathematics at Kaiserslautern University and completed his PhD in 2003.

ABSTRACT

Approximately 25 percent of all collisions are followed by a secondary impact, some of which lead to more severe injuries than in the first collision. As a countermeasure, Volkswagen group is introducing an automatic post collision braking system in the new Audi A3 and the new VW Golf. This presentation will explain this feature and as well as the development process outlining how new safety systems are being implemented to address relevant real world crashes. This approach is applied to integrated safety system development covering several critical areas, such as: how driver models are included, how side effects in real life are estimated, how accidents change with the introduction of new safety systems among others.

GRAPHICAL REQUIREMENTS AND VALIDATION TOOL FOR ADAS  
THURSDAY, NOVEMBER 7, 2013, 2:00 P.M.

Hong Bae has many years of experience in advanced driver assistance systems and autonomous driving, starting with automated highway systems projects with PATH (Partners for Advanced Transportation Technology). He started his professional career with General Motors R&D and was the team leader for the winning GM-CMU team at the 2007 DARPA Urban Challenge. He is now responsible for active safety system development, functional safety activities, control systems and systems integration at IAV Automotive Engineering, Inc. He holds a B.S. in Mechanical Engineering from University of California at Berkeley, and a M.S. and Ph.D. in Mechanical Engineering from Stanford University.

ABSTRACT

IAV has developed over the past 10 year for internal usage a tool that allows an easy and accurate requirement capturing as well as simulation and testing in ADAS (Advanced Driver Assistance System). This tool enables graphical representation of test scenarios (or scenes) that minimizes misunderstanding. This tool is very portable across all platforms since the test scenarios, once developed, only require standard web browsers. Therefore, these test scenarios or requirements can be played on any computer without installing a special software. This portability makes sharing of information particularly efficient when multiple parties are involved (for example, among OEM and suppliers) in development and clear communication of requirements is critical.
ACTIVE/PASSIVE SAFETY INTEGRATION
THURSDAY, NOVEMBER 7, 2013, 2:30 P.M.

Steve Kenner was appointed Global Director of the Automotive Safety Office at Ford Motor Company effective August 1, 2011. Mr. Kenner is responsible for leading Ford’s product safety efforts globally to enhance Ford’s leadership position in vehicle safety. Prior to this appointment, Mr. Kenner was the Engineering Director of Ford South America based in Brazil for three years. Before joining Ford South America, he was Chief Engineer of Brake Engineering in Ford North America. Mr. Kenner has over 30 years of experience in automotive engineering at Ford, Chrysler, and General Motors.

Mr. Kenner received his Bachelor’s Degree in Mechanical Engineering from Kettering University (formerly General Motors Institute) in 1983 and a Master’s Degree in Business Administration from the Stanford University Graduate School of Business in 1987.

ABSTRACT

As automotive manufacturers and suppliers continue making advancements in safety features, an area of research is in the integration of active and passive safety features. This presentation provides an overview of the key elements needed to facilitate integration of active and passive safety technologies. These elements include: (1) The development of appropriate active safety HMI warnings, (2) Sensor reliability and robustness, (3) “Resettable” vs. “non-resettable” safety systems and (4) Customer acceptance. Additionally, the presentation will provide an overview of a variety of safety and driver assist features that are currently in production.
SPEAKER BIOGRAPHIES AND ABSTRACTS

EXPERT PANEL DISCUSSION: ACTIVE AND PASSIVE SAFETY INTEGRATION
THURSDAY, NOVEMBER 7, 2013, 3:30 P.M.

Moderator:

Drew Winter
Editor-in-Chief
WardsAuto World magazine

Drew Winter is editor-in-chief of WardsAuto World, an internationally distributed digital magazine for the global auto industry and is a senior editor of WardsAuto.com, the leading website for automotive data and industry analysis. He has reported on the auto industry for more than 30 years.

Panelists:

Hideki Hada
General Manager IVS Department
Toyota Motor Engineering & Mfg.
NA Inc.

(See page 21 for complete biography)

Robert Jones
Product Director for Passive Safety Electronic
Robert Bosch LLC

Robert Jones started his career at Robert Bosch in 2000. In his first role, Mr. Jones led development for the "iBolt" occupant classification system, which was a Premier Automotive Suppliers’ Contribution to Excellence Award finalist. He then led systems development for passive restraint controls in North America. Most recently, Mr. Jones assumed the role of Product Director for passive safety electronics in North America.

John McGowan
Director, Safety Electronics
Infineon Technologies North America Corp.

John McGowan is Director, Safety Electronics for Infineon North America; with responsibility for the company’s products in applications such as restraints, driver assistance systems, braking, steering, chassis control, and tire pressure monitoring. From 2003-2009 he served as Director – Sensors & Wireless Control Products.

Thorsten Leonhardt
Requirement Coordination
Audi AG

(See page 29 for complete biography)
ETAS Inc
3021 Miller Rd
Ann Arbor, MI 48103
United States
www.etas.com

**BOOTH #2**
ETAS provides a comprehensive product portfolio of integrated tools designed to increase quality and efficiency in the development and maintenance of embedded systems, with solutions for modeling/integration, HIL, rapid prototyping, measurement/calibration and functional safety and security. Our tools are widely deployed in automotive, off-highway, and adjacent segments of the embedded industry.

FT Techno of America LLC
1750 N Smith Rd
Fowlerville, MI 48836
United States
www.ftt-a.com

**BOOTH #5**
Located in Fowlerville, MI, FTTA offers test track rental and testing services. Test tracks include: 20 acre VDA; 3 mile oval; Low/Middle Mu Surfaces; 4,500 ft. 4-lane straightaway; Special Surfaces; Garage and Office space. Active Safety Testing Services: Vehicle/Pedestrian Collision Avoidance, NHTSA NCAP – FCW/LDW/LKA/DBS/CIB; EURO NCAP – AEB; benchmark performance; off-site field testing.

Nolato SilikonTeknik AB
PO Box 175
Rocky Face, GA 30740
United States
www.nolato.com

**BOOTH #6**
Successful EMI shielding solutions! Nolato SilikonTeknik is a world leading developer and supplier of material and know-how for EMI shielding solutions made of electrically conductive silicone.

NVIDIA
2701 San Tomas Expressway
Santa Clara, CA 95050
United States
www.nvidia.com

**BOOTH #4**
NVIDIA, the leader in visual computing, drives innovation in industries from consumer electronics to cloud computing to automotive. Leveraging its deep expertise in computer graphics hardware and software, NVIDIA powers a wide range of vehicles today with digital instrument clusters, advanced driver assistance systems, fundamentally improving the way people drive.

TASS International
17193 N Laurel Park Dr Ste 205
Livonia, MI 48152
United States
www.tassinternational.com

**BOOTH #3**
For over 30 years, TASS International has provided groundbreaking solutions and services for passive, active and integrated safety. From cutting-edge simulation software (including the industry-standard MADYMO and the active safety virtual testing tool PRESCAN) to testing services and engineering safety solutions, TASS has been at the forefront of automotive safety.

Transportation Research Center Inc
10820 State Route 347
East Liberty, OH 43319
United States
www.trcpg.com

**BOOTH #1**
TRC Inc. specializes in research and development testing services. Brake, crashworthiness, durability, fuel economy, emissions, handling, and performance testing is conducted at the independent automotive proving ground. Facilities include a 7.5 mile (12.1 km) test track, 50-acre (20 hectare) vehicle dynamics area, 9,000 ft. x 84 ft. (2723 x 25 m) skid pad, off-highway area, and crash test facility.

---

**SPONSORS**
A special thank you to the following companies who have generously chosen to support this event.

---

**GOLD SPONSOR**

![Infineon](image)

*Wednesday’s Keynote*

---

**SILVER SPONSORS**

![Bosch](image)

*Bosch*
Invented for life
Registration and Symposium Lanyards

![FT Tecnologia](image)

*FT Tecnologia*
Tuesday Networking Lunch

---

**BRONZE SPONSORS**

![Delphi](image)

*Delphi*
Symposium Bags

![Flextronics](image)

*Flextronics*
Symposium Pens

![Toyota](image)

*Toyota*
Symposium Notepads
In today’s automotive climate, the automotive community is increasingly called upon to think strategically and form unique relationships that expand the reach of the industry into a new era of collaboration. The SAE 2014 World Congress assembles the best talent in the automotive industry; experts, management teams, engineers, and executives alike gather to collaborate and address these current challenges, celebrate evolution and achievement over the last 100+ years, and promote the multitude of opportunities fundamental for a successful future.

While the industry continues to evolve, one thing remains constant – around every corner new possibilities exist; relationships evolve into partnerships…what once seemed innovative becomes the standard…the impossible becomes possible. By *Creating New Possibilities* at the **2014 World Congress**, together we will shape the future of the automotive industry.
SAE CREDENTIALING

GAIN RECOGNITION FOR YOUR PROFESSIONAL EXPERTISE.
SAE International is pleased to provide focused credentialing opportunities for engineers and other professionals. Through SAE Credentialing, you can earn an SAE Certificate of Competency or full Professional Certification.

Certificate of Competency
Designed to validate mastery of knowledge in a focused content area, this program involves completing a single course and passing an industry-vetted exam that verifies your command of the material.

Certified Professional
Designed to validate a mastery of knowledge essential to the profession, certification involves completing established eligibility requirements (typically educational background and work experience), and passing an industry-developed and proctored exam that tests mastery of an industry-defined body of knowledge.

FOR MORE INFORMATION: sae.org/credentialing