

Automated and Connected Vehicle Systems Testing Symposium

EVENT GUIDE

JUNE 20-21, 2018

Greenville, South Carolina, USA



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AUTOMATED AND CONNECTED VEHICLE SYSTEMS TESTING SYMPOSIUM

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EVENT INFORMATION

Registration

Carroll A. Campbell Jr.
Graduate Engineering
Center Lobby

Wednesday, June 20
7 a.m.-5 p.m.
Thursday, June 21
7 a.m.-Noon

Networking Reception

Carroll A. Campbell Jr.
Graduate Engineering
Center Lobby

Wednesday, June 20
5:45 p.m.-7 p.m.

Sponsored by



Live C2M2 Demos

Wednesday, June 20
11:15 a.m.- 12:30 p.m.
2:15 p.m.-3 p.m.

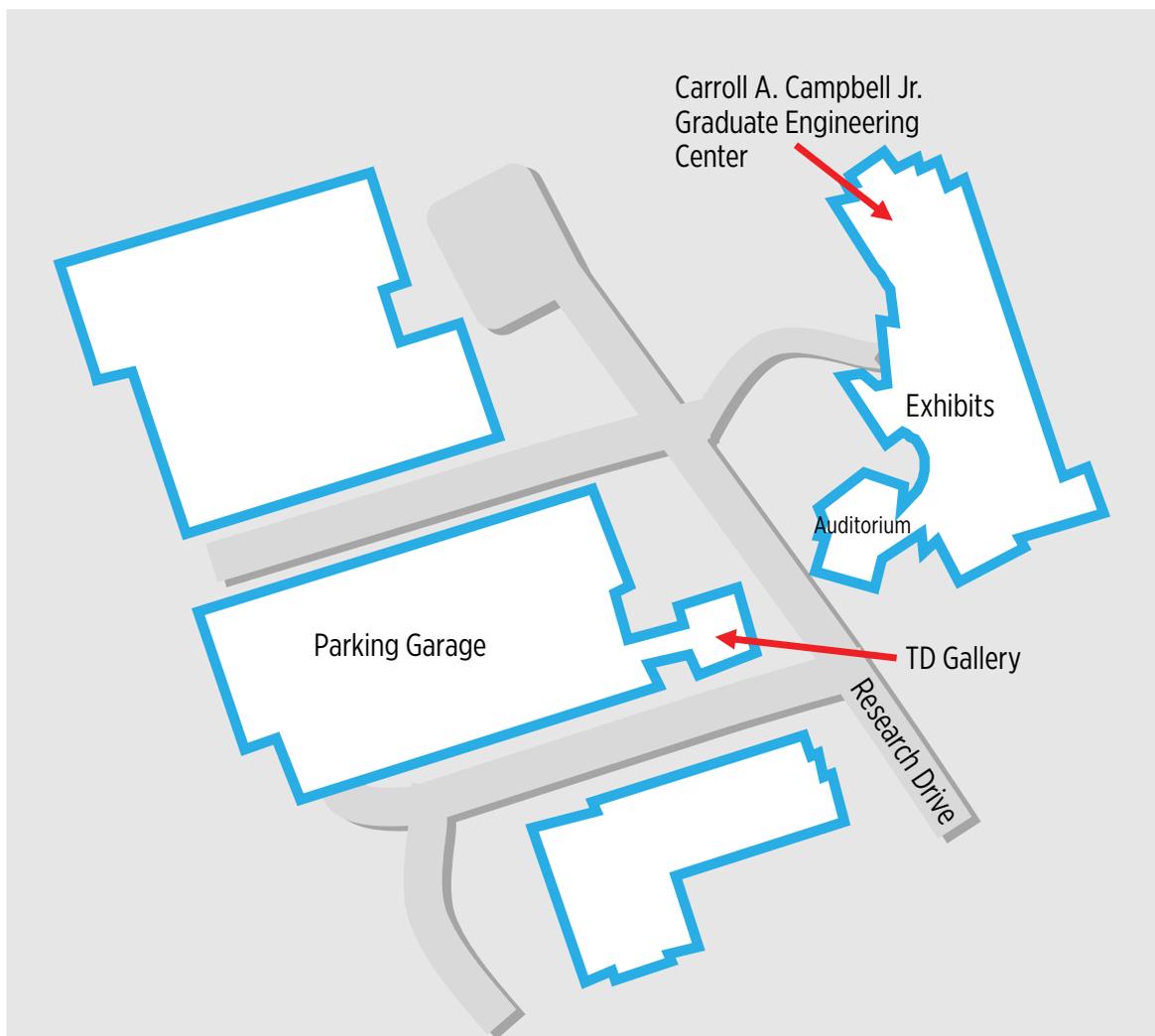
Networking Lunches

TD Gallery

Wednesday, June 20
11:15 a.m.-12:30 p.m.

Thursday, June 21
11 a.m.-12:30 p.m.

FACILITY FLOOR PLAN





EVENT-AT-A-GLANCE AUTOMATED AND CONNECTED VEHICLE SYSTEMS TESTING SYMPOSIUM

June 20-21, 2018

June 20

WEDNESDAY

7 a.m. - 5 p.m.
Registration

9 - 9:30 a.m.
Opening Address

Dr. Venkat Krovi, Clemson University, CU-ICAR and Executive Program Chair

9:30 - 11:15 a.m.
Panel: To err is Human. Is your automated vehicle safer than you?

11:15 a.m. - 12:30 p.m.
Lunch

12:30 - 2:15 pm
Panel: Safe Automated Vehicles Benchmarking

2:15 - 3 p.m.
Networking Break

3 - 3:30 p.m.
Kenote Address
Ontology: Tool for Broad Spectrum Knowledge Integration
Barry Smith, Director, National Center for Ontological Research

3:30 - 5:15 p.m.
Panel: To Augment Reality (or Not): A Quintessential Test & Validation Question?

5:15 - 5:45 p.m.
Keynote Address
Southern Automotive Women's Forum (SAWF)
Overcoming regulatory barriers to innovation in the automotive industry
June Satterfield, Director, Industry Standards and Government Regulations, Michelin North America, Inc.

5:45 - 7 p.m.
Reception

*Sponsored by
Michelin North America, Inc.*

June 21

THURSDAY

7 a.m. - 12 p.m.
Registration

8:30 - 8:45 a.m.
Opening Address
Dr. Venkat Krovi, Clemson University, CU-ICAR and Executive Program Chair

8:45 - 9:15 a.m.
Keynote Address
Deploying safe, robust and reliable CAV technologies: Now comes the hard part.
Tom Dingsus, Director, Virginia Tech Transportation Institute

9:15 - 11a.m.
Panel: What's next in Performance Testing and Evaluation of CAV Technologies (across the globe)?

11 a.m. - 12:30 p.m.
Lunch

12:30 - 2:15 p.m.
Panel: SAE Automated Vehicle Standards and Initiatives

2 - 2:15 p.m.
Keynote Address
Testing in a Learning Environment
Alain Kornhauser, Director, Transportation Program, Faculty Chair, Princeton Autonomous Vehicle Engineering, Princeton University

2:15 - 3 p.m.
Networking Break

3 - 4:45 p.m.
Panel: Show Me the Money: Monetizing Vehicle Connections

4:45 - 5:00 p.m.
Closing Remarks
Dr. Venkat Krovi, Clemson University, CU-ICAR and Executive Program Chair

P18231774



**Keynote Speaker:
Ontology: Tool for Broad
Spectrum Knowledge
Integration**

Wednesday, June 20
3 p.m.-3:30 p.m.

Barry Smith

Director of the National Center for Ontological Research (NCOR) and Professor of Philosophy, Biomedical Informatics, Computer Science and Engineering, and Neurology at SUNY Buffalo

Director of the National Center for Ontological Research (NCOR) and Professor of Philosophy, Biomedical Informatics, Computer Science and Engineering, and Neurology at SUNY Buffalo

Barry Smith is recognized as one of the world's foremost authorities in the field of applied ontology. He is Director of the National Center for Ontological Research (NCOR) and Professor of Philosophy, Biomedical Informatics, Computer Science and Engineering, and Neurology at SUNY Buffalo. Smith is the lead developer of Basic Formal Ontology (BFO), the most commonly adopted upper-level ontology development framework, now used in over 300 civilian and government ontology initiatives throughout the world. He is also one of the initiators of the NIST Industrial Ontology Foundry project, whose goal is to develop a set of ontology modules to support interoperability of software in the digital manufacturing field.

The current industrial revolution is said to be driven by the digitization of manufacturing that exploits connected information across all aspects of manufacturing. Standards have been recognized as an important enabler. Ontology is the next generation standard for connected information.



**Keynote Speaker by
Southern Automotive
Women's Forum (SAWF)
Overcoming Regulatory
Barriers to Innovation in
the Automotive Industry**

Wednesday, June 20
5:15 p.m.-5:45 p.m.

June Satterfield

Director, Industry Standards and Government Regulations, Michelin North America, Inc.

June Satterfield is Director of Industry Standards and Government Regulations for Michelin North America in Greenville, South Carolina. She has a Bachelor of Science degree in Civil Engineering from Clemson University and a Masters of Science degree in Engineering Mechanics and Sciences from the University of Florida. She has

worked for Michelin for 30 years, holding various technical (tire performance assessment and design), competency management and process improvement roles in the R&D environment. Prior to her current assignment, she was Director of Progress and Training and served as a member of Michelin's North American R&D leadership team.

Another notable career highlight includes a prior assignment in the standards and regulatory department following the passage of the TREAD Act. During this time she represented both Michelin and the tire industry in key leadership roles including leading the ASTM task group on Aged Tire Durability and the ISO working group on rolling resistance, and serving on a number of committees in the Tire Rim Association, United States Tire Manufacturers Association, ASTM, ISO and SAE.

Prior to joining Michelin, Ms. Satterfield worked in the satellite communication and aerospace industry for Harris Corporation in Melbourne, Florida.



**Keynote Speaker:
Deploying Safe, Robust
and Reliable CAV
Technologies: Now
Comes the Hard Part**

Thursday, June 21
8:45 a.m.–9:15 a.m.

Thomas A. Dingus, Ph.D., CHFP

Director, Virginia Tech Transportation Institute

Thomas A. Dingus is Director of the Virginia Tech Transportation Institute (VTTI), is an endowed professor of Virginia Tech, and is the President of VTT, LLC.

Since 1996, Dingus has managed the operations and research at VTTI, which annually conducts more than

\$38 million in sponsored research. He has performed transportation safety and human factors research since 1984, focusing on automated and connected vehicles, driver distraction and attention, the safety and usability of advanced in-vehicle devices, crash avoidance countermeasures, and fatigue. He has led substantial efforts in growing Virginia as a pioneer in automated-vehicle research, with VTTI and partners creating a suite of advanced test beds—including the Virginia Automated Corridors in Northern Virginia and the Virginia Smart Roads in Blacksburg, VA—that facilitate both public roadway and edge-and-corner (e.g., surface street, rural roads) test scenarios.

Dingus pioneered the naturalistic driving study research method, which involves instrumenting vehicles with unobtrusive video cameras and sophisticated instrumentation that assess crash and near-crash causation and help determine crash countermeasures.



**Keynote Speaker:
Testing in a Learning
Environment**

Thursday, June 21
2 p.m.–2:15 p.m.

Alain L. Kornhauser

**Professor of Operations Research & Financial
Engineering, Princeton University**

Born in France, Alain Kornhauser immigrated to western Pennsylvania with his parents at the age of 7. He studied Aerospace Engineering at Penn State where he obtained a BS and MS. Kornhauser is completing his 46th year on the Princeton faculty as Professor of Operations Research & Financial Engineering. He serves as Director of the Transportation Program where he continues his basic research in Transportation focused on the real-time operation of large fleets of driverless vehicles and on the development of Deep-Learning Neural Networks that safely drive road vehicles. He was the Faculty Leader of Princeton's entries the 2005 DARPA Grand Challenge and 2007 Urban Challenge and continues his interest in the complete automation of the automobile with particular interest in the autonomous Taxi concept and its potential to transform mass transit and deliver ubiquitous mobility to everyone.

SAE International Welcomes SAWF Members for Soirée

The Southern Automotive Women's Forum hosts periodic events which offer women in the industry multiple opportunities:

- Network with each other and with influential leaders
- Spotlight successful professional women and provide insights to their career success
- Learn new skills (technical, leadership, career advancement, etc.)
- Learn about critical issues in the industry to prepare them to lead their organizations forward
- Raise scholarship funds from a portion of the proceeds of each event and from promoting scholarship goals to industry colleagues

The SAWF Mission and Vision The Southern Automotive Women's Forum hosts periodic events which offer women in the industry multiple opportunities:

The Southern Automotive Women's Forum is a 501(c)(3) nonprofit dedicated to the personal and professional advancement of women in the automotive industry. SAWF achieves this mission by collaborating with industry partners to create educational, mentorship, and networking opportunities for its members. Our members serve as strong role models for one another and for young women of all ages who are interested in STEM fields (Science, Technology, Engineering, and Math) with the hope that they will apply these skills to the automotive industry of the future. Since its inception in 2010, SAWF has also awarded over \$200,000 in scholarship funds to young women beginning their careers in STEM and to women seeking to enhance their opportunities.

SAWF Website for more information: southernautomotivewomen.org/.



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P18215933



CENTER FOR CONNECTED MULTIMODAL MOBILITY (C2M2)



Live Demonstrations of New Life Saving and Congestion Crashing Connected Vehicle Technologies at SAE Automated and Connected Vehicle Systems Testing Symposium

June 20, 2018, 11:15 to 12:30 p.m. and 2:15 to 3 p.m.



**Dr. Ronnie
Chowdhury**
Director, C2M2

The ever-increasing congestion along major corridors and cities both in the United States and abroad has hindered regional and global economic progress and quality of life. Furthermore, each year traffic crashes lead to the deaths of more than 35,000 people in the United States alone. To overcome the congestion and crashes that impart heavy toll on our economy and day-to-day activities, connected vehicle technologies, once deployed, hold great promises. The Center for Connected Multimodal Mobility (C2M2) at Clemson University, a U.S. Department of Transportation (USDOT) Tier 1 University Transportation Center, will be conducting live demonstrations of the connected vehicle technologies at the SAE Automated and Connected Vehicle Systems Testing Symposium on June 20, 2018, between 11:15 a.m. to 12:30 p.m. and between 2:15 to 3 p.m., at the Clemson University–International Center for Automotive Research (CU-ICAR), Greenville, SC. These technologies enable vehicles, pedestrian devices (e.g., cell phones) and traffic signals work collaboratively to eliminate crashes and time lost due to traffic congestion. Previously, C2M2 researchers demonstrated the connected vehicle technologies to public agency officials, industry leaders and researchers in multiple conferences held in North Carolina, South Carolina and Florida. In the upcoming field demonstrations in Greenville, C2M2 researchers will show connected vehicle applications including technologies that will help eliminate crashes and traffic congestion. They will also demonstrate their latest innovation in detecting and preventing cybersecurity threats on the connected transportation system. Dr. Mashrur “Ronnie” Chowdhury, the Director of C2M2 and the Eugene Douglas Mays Professor of Transportation at Clemson University, will lead this demonstration.

C2M2 Website: cecas.clemson.edu/C2M2/

AGENDA

Wednesday, June 20

Auditorium

Time	Title
9 a.m.	<p>Welcoming Address</p> <p><i>Dr. Venkat Krovi, Clemson University, CU-ICAR and Executive Program Chair</i> <i>Frank Menchaca, Chief Product Officer, SAE International</i></p>
9:30 a.m.	<p>Panel: To Err is Human. Is your automated vehicle safer than you?</p> <p>The goal of this session is to shed light on the general question “will future automated vehicles be safer than today’s human drivers?” It is commonly suggested that automated vehicles will have large safety benefits due to the facts that (1) the great majority (+90%) of today’s crashes involve human error or unsafe behaviors (e.g., distraction, fatigue, aggressive driving) and (2) such behaviors are not expected to be exhibited by automated vehicles. However, it is not clear precisely how these benefits are expected to come about and many issues remain open. For example, through automation, how might the elimination of human unsafe behaviors translate into actual crash reduction? Are there other beneficial effects of automation on safety beyond the elimination of human error?</p> <p>Furthermore, the introduction of automation may produce new types of crashes, thus inducing unintended consequences and potential safety dis-benefits. These may be related to technical limitations as well as failures in the interaction between the human driver/operator and the automated vehicle. With respect to the former, how do current state-of-the-art AI vehicle control algorithms compare to human drivers in managing the complexity and uncertainty of traffic situations? Are there any fundamental limitations of current AI systems in this respect?</p> <p>Potential issues related to the human-automation interaction involve drivers’ inadequate understanding of the functional limitations of the automation, overreliance, automated vehicle drivers getting “out of the loop” and failing to properly resume control when requested as well as the possible atrophy of manual driving skills. Also, the interaction between the automated vehicle and the surrounding traffic (which may include both manually driven and automated vehicles) introduces important human factors issues, primarily related to other road users’ understanding of the automated vehicle and their expectations on how it will behave.</p> <p>The net safety impact of automated vehicles can be understood as the sum of these potential benefits and dis-benefits and a key question is how these safety impacts can be evaluated, both prospectively (prior to market deployment) and retrospectively (after deployment). One key challenge here relates to the fact that crashes are rare events and, hence, demonstrating with statistical significance that automated vehicles are safer than certain criterion (e.g., human performance) will require extensive amounts of real world data.</p> <p><i>Moderators - Johan Engström, Group Leader, Center for Truck & Bus Safety, Virginia Tech Transportation Institute</i></p> <p><i>Panelists - Jay Ellis, Director of Business Development, PolySync</i> <i>Laura Fraade-Blanan, NIH/NIA Postdoctoral Fellow, RAND Corporation</i> <i>John Davidson Lee, Emerson Professor, University of Wisconsin - Madison</i> <i>Jon Mueller, Safety Program Manager, US Dept of Transportation - FMCSA</i> <i>Slaven Slijivar, Vice President, Analytics, Smartdrive Systems Inc.</i></p>
11:15 a.m. - Networking Lunch in the TD Gallery	
12:30 p.m.	<p>Panel: Safe Automated Vehicles Benchmarking</p> <p>Autonomous vehicles (AVs) have already driven millions of miles on public roads, but even the simplest maneuvers such as a lane change or vehicle overtake have not been certified for safety. Current methodologies for testing of Advanced Driver Assistance Systems, such as Adaptive Cruise Control, cannot be directly applied to determine AV safety as the AV actively makes decisions using its perception, planning and control systems for both longitudinal and lateral motion. These systems increasingly use machine learning components whose safety is hard to guarantee across a range of driving scenarios and environmental conditions. New approaches are needed to bound and minimize the risk of AVs to reassure the public, determine insurance pricing and ensure the long-term growth of the domain. So what type of evidence should we require before giving a driver’s license to an autonomous vehicle?</p> <p>The specific objective of this session includes (but is not limited to):</p> <ol style="list-style-type: none"> 1. Approaches for high-confidence testing and verification of end-to-end AV operations. This includes techniques for capturing test scenarios which provide different levels of confidence in AV’s perception, planning and control. 2. Generating synthetic scenarios including different road/traffic/weather conditions, etc. to effectively search for adverse behavior. Providing equivalence tests for agent behavior trained and tested in both real and synthetic environments. 3. Blending testing and verification of black-box systems with more conventional functional safety ISO 26262 best practices and showing how these fit into an overall safety case. 4. Forensic analysis of accidents and near accidents with arguments for blame assignment with the captured drive traces. 5. Evaluation of insurance and liability issues across the ADAS spectrum. <p><i>Moderators - Rahul Mangharam, Associate Professor, Electrical & Systems Engineering, University of Pennsylvania</i></p> <p><i>Panelists - Jeff Blackburn, Head of Business Development, Metamoto</i> <i>Krzysztof Czarnecki, Professor of Electrical and Computer Engineering, University of Waterloo</i> <i>Mary Joyce, Global Director, Electronics, Electrification, Autonomy and Dynamics, SGS Transportation</i> <i>Philip Koopman, Co-Founder, Edge Case Research</i> <i>Olaf Op den Camp, Senior Consultant, Integrated Safety, TNO</i> <i>Jack Weast, Sr. Principal Engineer, Chief Systems Architect, Intel Corporation</i></p>

2:15 p.m. - Networking Break

AGENDA

Wednesday, June 20

Auditorium

Time	Title
3 p.m.	<p>Keynote Address Ontology: Tool for Broad Spectrum Knowledge Integration</p> <p>The ontology approach to knowledge integration is much more flexible than approaches based on traditional relational database technology, and is thus ideally suited to achieve results in those areas where we are dealing with a broad spectrum of different sorts of data that is rapidly expanding into new areas. Unfortunately, in almost all cases where ontology technology has been tried, it has produced results which are fragmentary and inconsistent, and have typically enjoyed a short half-life. Barry Smith will describe the reasons for these failures, and outline a strategy for the creation of interoperable ontology modules that has been used with success in the biomedical and military domains, and is currently being applied in the field of digital manufacturing.</p> <p><i>Barry Smith, Director, National Center for Ontological Research</i></p>
3:30 p.m.	<p>Panel: To Augment Reality (or Not): A Quintessential Test & Validation Question?</p> <p>Validating the safety of Connected Automated Vehicles (CAVs) is a significant challenge. Safety validation strategies based solely on brute force on-road testing campaigns are unlikely to be viable in the long term. Simulations and exercising edge-case scenarios should reduce validation cost, but to succeed, we must also adopt a more nuanced view of validation data collection and analysis. Validation approaches can be improved by using higher fidelity testing to explicitly validate the assumptions and simplifications of lower fidelity testing rather than just obtaining sampled replication of lower fidelity results.</p> <p>Disentangling multiple testing goals can help by separating validation processes for requirements, environmental model sufficiency, autonomy correctness, autonomy robustness, and test scenario sufficiency. For autonomy approaches with implicit designs and requirements, such as machine learning training data sets, establishing observability points in the architecture can help ensure that vehicles pass the right tests for the right reason. These principles could improve both efficiency and effectiveness for demonstrating CAV safety as part of a phased validation plan that includes both a “driver test” and lifecycle monitoring as well as explicitly managing validation uncertainty.</p> <p>While this session will help clarify this challenge, our true goal is to propose solutions. The discussion in this session is designed to bring practitioners together to analyze and improve potential solutions. Going forward, we would like to identify best practices from conventional practice (e.g., ISO 26262, MIL-STD-882E), techniques under development (SOTIF), and novel new approaches suitable for cutting-edge technologies such as deep learning.</p> <p><i>Moderators - Michael Wagner, CEO, Edge Case Research LLC</i></p> <p><i>Panelists - Bob Grabowski, Deputy Chief Technology Officer, Advanced Robotics for Manufacturing (ARM)</i> <i>Adit Joshi, Research Engineer, Automated Driving HIL Simulation, Ford Motor Company</i> <i>Oleg Kirovskii, Safety Analyst, Global Engineering Excellence - System Safety, ZF</i> <i>Çetin Meriçli, Co-founder & CEO, Locomotion</i> <i>Barry Smith, Director, National Center For Ontological Research</i></p>
5:15 p.m.	<p>Special Keynote by Southern Automotive Women’s Forum (SAWF) Overcoming regulatory barriers to innovation in the automotive industry</p> <p>Technology is changing at an accelerating rate while regulations remain static by comparison, dominated by performance requirements based on established technology. This leads to regulatory roadblocks inhibiting the development and delivery of safer, higher technology products in the market. For the automotive industry, including the development of autonomous vehicles, this issue extends beyond vehicle manufacturers to include the need for regulated component manufacturers to test new ideas.</p> <p><i>June Satterfield, Director, Industry Standards and Government Regulations, Michelin North America, Inc.</i></p>
5:45 p.m. - Networking Reception	

Time	Title
8:30 a.m.	<p>Welcoming Address <i>Dr. Venkat Krovi, Clemson University, CU-ICAR and Executive Program Chair</i></p>
8:45 a.m.	<p>Keynote Address Deploying safe, robust and reliable CAV technologies: Now comes the hard part.</p> <p>Everyone's goal is to deploy safe, robust and highly reliable (i.e., operate as intended, almost never fail and always fail safe) vehicle automation that achieves the promise of saving lives, improving mobility and reducing pollution. Deployment is inevitable but a number of hurdles still exist to realize that dream. These hurdles include:</p> <ol style="list-style-type: none"> 1) Determining how safe is safe enough and reaching that goal throughout a long deployment cycle. Although human drivers are the primary causes of the vast majority of fatal and injury crashes, the average driver is actually very safe. The average driver is involved in a police reported crash about once every 18 years or 238,000 miles. "Good" drivers (who choose to generally drive alert, attentive and sober) are about 3 times as safe meaning that many will not be involved in an injury crash in a lifetime of driving. So does "safe enough" mean that an automated vehicle can never have an injury crash? Regardless, what is the right goal and how do we achieve it while protecting the public during development, testing, evaluation and deployment? 2) Coping with variability and uncertainty. Automated vehicles will be required to operate in a highly variable environment. This variability includes a wide variety of environmental and situational aspects in a wide variety of operating environments. However, in addition, automated vehicles need to operate in a "mixed manual/automated" environment for many years to come. Even within the automated fleet, vehicles will vary in capability, operational characteristics and intended operational domains. These multiple layers of variability add to the challenge of successfully deploying such systems at all stages, including the assessment of performance and safety. 3) The need to continue to develop a new strategy for performance and safety assessment. An innovative, multifaceted approach to assessment is needed to support continued, rapid advancement and innovation while protecting the public. Such a strategy will undoubtedly have more levels of evaluation than has been historically true for new technologies deployed in a manually-driven vehicle. Examples of practices that are evolving development approaches: <ul style="list-style-type: none"> • Collecting data from a production vehicle to use in simulation to evaluate the new technologies. • Running a ghost technology on deployed vehicles before actually deploying/releasing the technology. • Post-deployment monitoring and over-the-air up updates to continually improve the systems performance and limit unintended consequences or failures. <p>Each of these hurdles will be presented and discussed in detail using recent data and examples. <i>Thomas A. Dingus, Director, Virginia Tech Transportation Institute</i></p>
9:15 a.m.	<p>Panel: What's Next in Performance Testing and Evaluation of CAV Technologies (across the globe)?</p> <p>CAVs are on roadways around the world. Whether in Europe, Asia or North America, CAV testing has a specific relevance to nationally-acceptable safety evaluation practices applicable to automated driving systems (ADSs). Radical new approaches in testing and evaluation are critical in proving that CAVs can perform safely.</p> <p>Globally, exploration of the trade-offs has resulted in a range of deployments from: small pilots to large cooperative test beds; operating on closed-tracks on off-roadway sites to entire on-roadway zones, precincts and corridors; from individual stakeholders to entire public-private partnerships. What will it take to go beyond testing and pilot efforts to get to scale and begin deploying vehicles commercially? What lessons can be learned from such deployments? Which of these are the most promising?</p> <p>This session will share best practices and discuss future trends from practitioners with experiences in various scaled deployment settings and explore what barriers remain to realize scale in this space from both a technology and regulatory perspective.</p> <p><i>Moderators - Joachim G. Taiber, Chief Technology Officer, International Transportation Innovation Center (ITIC)</i></p> <p><i>Panelists - Charlie Cheng, President, Shanghai International Automobile City - A NICE City</i> <i>Thomas A. Dingus, Director, Virginia Tech Transportation Institute</i> <i>Alexander Kraus, Senior Vice President Automotive, TÜV SÜD</i> <i>Eddie Mottern, Director of Programs, Robotics Research Corporation</i> <i>Kirk T. Steudle, Director, Michigan Dept. of Transportation (MDOT)</i> <i>Edward Straub, Technical Program Director, The American Center for Mobility</i></p>

11 a.m. - Networking Lunch in the TD Gallery

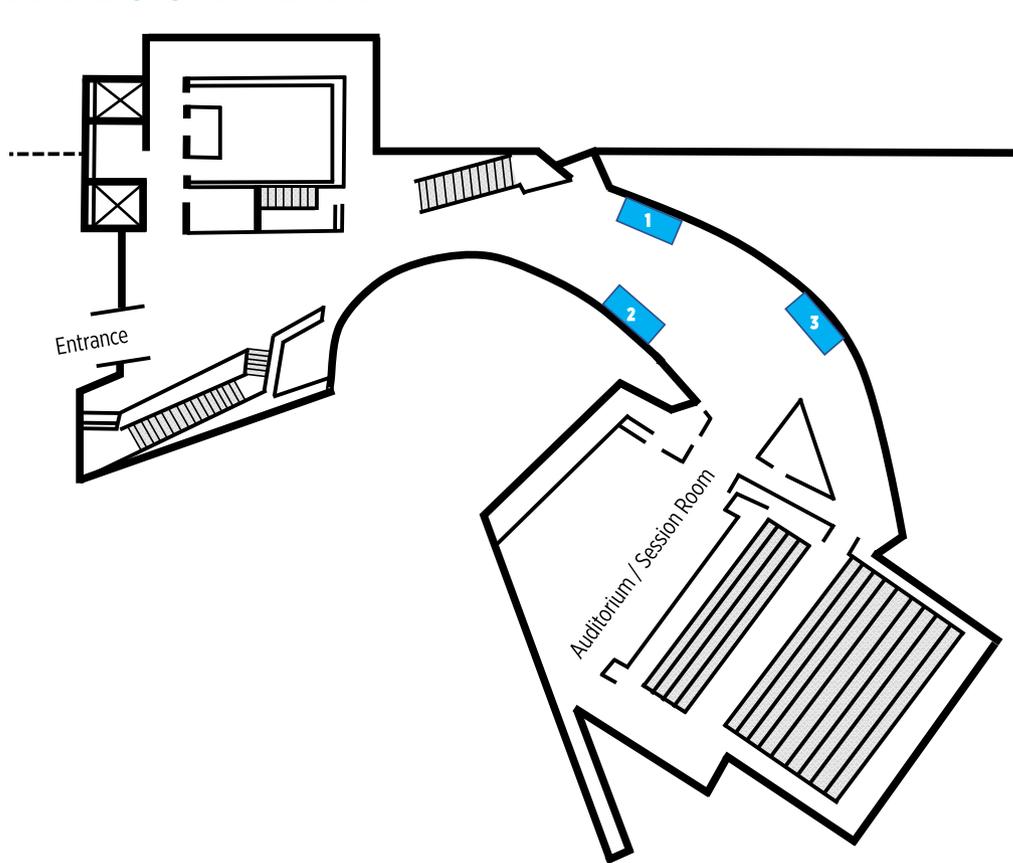
AGENDA

Thursday, June 21

Auditorium

Time	Title
12:30 p.m.	<p>Panel: SAE Automated Vehicle Standards and Initiatives</p> <p>The mobility industry has looked to SAE for 100+ years to help solve the industry's toughest challenges. In this session, learn about how SAE is working with OEMs, suppliers, academia, government and others to establish recommended practices and standards that would benefit the advancement of safety testing and deployment of Connected and Automated Driving Systems (ADS).</p> <p>Vehicle Connectivity, including the real prospects of hands-free and fully autonomous driving, is revolutionizing personal mobility as profoundly as the invention of the automobile did 130 years ago. Cars, light trucks, and commercial vehicles equipped with vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I) technologies are capable of reducing crashes, energy consumption and pollution, as well as mitigating the costs associated with traffic and parking congestion. Autonomous vehicles may contribute to a new urban development with greater mobility for the elderly, the disabled and the blind. However, the high level of complexity and disruption in this area must be accompanied by standards development to enable safe, reliable and faster deployment. SAE currently has over 55 active committees working across the passenger and commercial vehicle sectors on an expansive set of critical Connected and Automated Vehicle subjects. The session will highlight this critical work.</p> <p><i>Moderators - Jack Pokrzywa, Director, Ground Vehicle Standards, SAE International</i></p> <p><i>Panelists - **Dan Bartz, Development Lead- Advanced Development, Fiat Chrysler Automobiles</i> <i>Cem Hatipoglu, Director, Office of Vehicle Crash Avoidance and Electronic Controls Research, NHTSA</i> <i>George Nicols, Advanced Technology Standards Engineer, Product Regulatory Affairs, Toyota Motor North America</i></p> <p><i>** Invited</i></p>
2 p.m.	<p>Keynote</p> <p>Testing in a Learning Environment</p> <p><i>Alain Kornhauser, Director, Transportation Program, Faculty Chair, Princeton Autonomous Vehicle Engineering, Princeton University</i> <i>Testing in a Learning Environment</i></p>
2:15 p.m. - Networking Break	
3 p.m.	<p>Panel: Show Me the Money: Monetizing Vehicle Connections</p> <p>This session will assess how car companies are gathering, aggregating and interpreting vehicle data across a range of key applications ranging from insurance and diagnostics to content consumption and contextual marketing.</p> <p>Key issues to be addressed will include: What data? How much? How often? Managing and marketing vehicle data internally? Aggregating and sharing data with competing car companies.</p> <p><i>Moderators - Edward Sanchez, Senior Analyst, Automotive, Strategy Analytics</i></p> <p><i>Panelists - Joe Fried, Senior Director Business Development & Sales, Americas, Otonomo</i> <i>Roderick Mackenzie, CEO, Drive Time Metrics Inc.</i> <i>Jason Verlen, Senior Vice President, Product Management, CCCIS</i> <i>Robert Vogt IV, Chief Technology Officer, Voyomotive LLC</i> <i>Julian Weber, Corporate Quality, BMW Group</i></p>
4:45 p.m.	<p>Closing Remarks</p> <p><i>Dr. Venkat Krovi, Clemson University, CU-ICAR and Executive Program Chair</i></p>

EXHIBIT FLOOR PLAN



EXHIBITOR PROFILE

Exhibitor Directory text is published as submitted by exhibiting companies.

ADVANCED TEST EQUIPMENT RENTALS Booth 3

10401 Roselle St
San Diego, CA 92121
United States
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Rent automotive transient test systems: generators, voltage drop simulators or any of the thousands of other pieces of test equipment in stock at Advanced Test Equipment Rentals (ATEC). Get all the calibrated test equipment you need for test standards from the industry's trusted rental leader...Advanced Test Equipment Rentals.

SAE INTERNATIONAL CAROLINA SECTION Booth 1

400 Commonwealth Drive
Warrendale, PA 15096
United States
Carolina.SAE.org

SAE International is a global body of scientists, engineers, and practitioners that advances self-propelled vehicle and system knowledge in a neutral forum for the benefit of society. The SAE Carolina Section is an outstanding resource for people involved in all aspects of the mobility industry in and around the North and South Carolina areas.

CGF LLC - COUNSEL GROUP FRANKFURT Booth 2

119 N Markley St
Greenville, SC 29601
United States
cgf-llc.com

CounselGroupFrankfurt has developed great results for our American clients. CGF has been providing quality IT services and solutions in South Carolina for more than 5 years including: IT Device Life Cycle Management, IT Solutions and Support, and Professional Services. Additional Services: DaaS, Security Center of Excellence, Industrial tablets and scanners.

A MEETING OF MINDS | A MERGING OF IDEAS

CONNECT2CAR™

EXECUTIVE LEADERSHIP FORUM

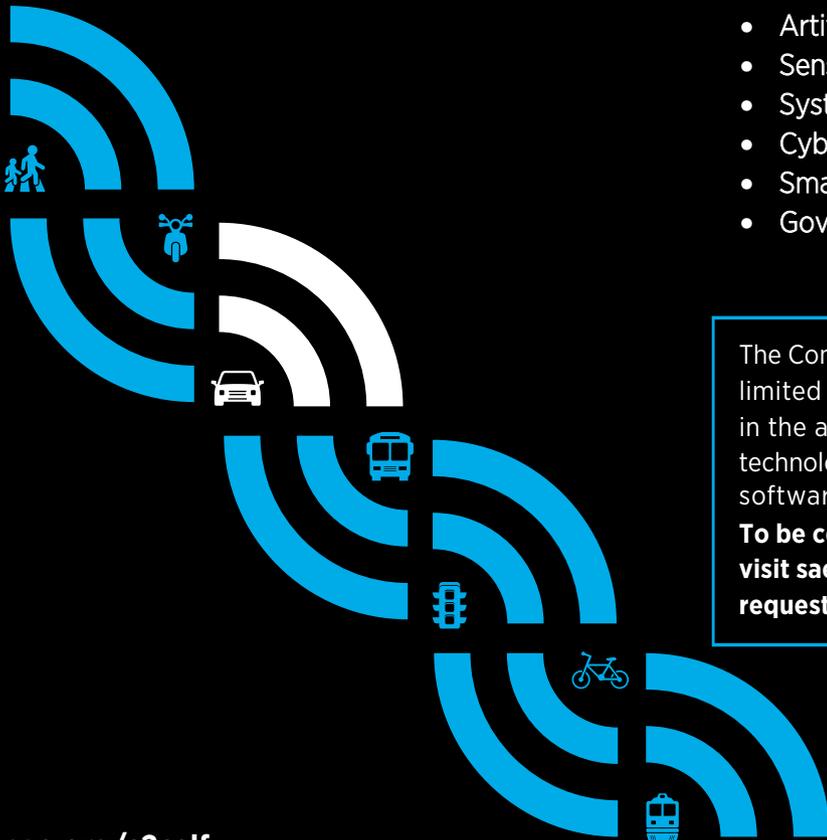
SEPTEMBER 5-6, 2018
SAN JOSE, CALIFORNIA
DOLCE HAYES MANSION

THE CONNECT2CAR EXECUTIVE LEADERSHIP FORUM RETURNS IN 2018.

This invitation-only event brings top automotive, electronic, and technology executives together for a high-level look at the future of automotive connectivity from a senior management perspective, including:

- Wireless technologies
- Artificial intelligence
- Sensor technology
- Systems integration
- Cyber security
- Smart cities
- Government direction

The Connect2Car Executive Leadership Forum is limited to C-level management personnel working in the automotive industry focused on electronics, technology insertion, systems integration, software development and aftermarket systems. **To be considered for this invitation-only event, visit sae.org/c2celf to submit your invitation request.**



2018

SAE Battelle CyberAuto Challenge™

July 23-27
Warren, MI

Connect2Car Executive Leadership Forum

September 5-6
San Jose, CA

COMVEC 18

September 11-13
Rosemont, IL

On-Board Diagnostics Symposium

September 11-13
Indianapolis, IN

North American International Powertrain Conference

September 12-14
Chicago, IL

International Powertrains, Fuels & Lubricants Meeting

September 17-19
Heidelberg, Germany

Aerospace Manufacturing and Automated Fastening Conference and Exhibition

October 2-4
Charleston, SC

From ADAS to Automated Driving

October 8-11
Detroit, MI

Thermal Management Systems Symposium

October 9-11
San Diego, CA

Brake Colloquium & Exhibition

October 14-16
Palm Desert, CA

Heavy Duty Diesel Emissions Control Symposium

October 16-17
Gothenburg, Sweden

SAE/JSAE Small Engine Technology Conference

November 6-8
Dusseldorf, Germany

Aerospace Systems + Technology Conference

November 6-8
London, UK

Defense Maintenance and Logistics Exhibition

December 17-19
Tampa, FL

Defense Maintenance and Logistics Symposium

December 17-20
Tampa, FL