25th International Technical Conference on the Enhanced Safety of Vehicles

Announcement and Call for Abstracts

The 25th ESV conference organizing committee is pleased to announce that it is now accepting abstracts for consideration. Abstracts form the basis for the technical papers that will be accepted on a wide range of topics in vehicle safety and invited for presentation at the ESV 2017 Conference and for publication in the Proceedings. All abstracts will be subject to review and approval by Abstract Review Committees, and should not have been published elsewhere or submitted for presentation at another conference prior to presentation at the ESV 2017 Conference. For the 3rd time, ESV will select a limited number of abstracts for full paper submission and eventual publication in a special edition of a scientific journal. To assist you in your abstract submission, please refer to the abstract submission guidelines and description of technical session topics provided below.

Abstract Submission Guidelines


- Abstracts should contain text only. Do not include photographs, figures, tables, graphs or other media.

- All abstracts will be judged on three areas: Technical quality, originality and relevance of work. Predominantly commercial abstracts will be declined.

- Abstracts will be submitted in one of three categories: Peer-review, Oral and Written (paper not peer-reviewed) or Written only. Peer-reviewed and Oral and Written papers will be presented at the conference. If the content of a technical paper is different from the session chair’s accepted abstract, the technical paper will be disqualified.

- In order to be considered, all abstracts must be submitted in English, not to exceed 500 words, and should provide information on each of the following 5 points:
  - Research Question/Objective
  - Methods and Data Sources
  - Results
  - Discussion and Limitations
  - Conclusion and relevance to session submitted
You must indicate your preference for your abstract to be considered for peer-review and you must submit your abstract by midnight, August 19th, 2016, GMT. Abstracts not accepted for peer-review paper will be referred back to session chairs for further consideration as an Oral and Written or Written Only paper.

Accepted abstracts will be posted on the National Highway Traffic Safety Administration (NHTSA) ESV website prior to the conference. Moreover, the full conference proceedings containing technical papers presented at the conference including peer-review papers published by a Scientific Journal will also be made available at no cost to conference attendees and the ESV community. The website address for these proceedings when they become available is http://www-esv.nhtsa.dot.gov/

Notification to Authors

By the specified dates below, authors will receive email notification(s) on the status of their submitted abstract(s). Acceptance or rejection notices will also be available on the submission website http://submissions.mirasmart.com/25ESV. Authors of accepted abstracts will be provided guidelines for writing their technical papers. They will be able to upload and review their final paper prior to submission. The decisions of the abstract and paper review committees are final and not negotiable.

To be considered for peer-review, you must submit your abstract by midnight, August 19th, 2016, GMT and indicate during submission that you want to be considered. You can do so by checking the box provided next to the option. If the abstract is accepted for peer-review, you will have approximately 77 days to prepare your draft paper which is due by December 16th, 2016. A three month review cycle is anticipated between reviewers and authors to submit and edit papers for publication based on reviewers’ comments and the formatting guidelines of the journal that will be printing the special edition. If the paper is not accepted for peer-review publication before the final review cycle starting on February 23rd, 2017, it will be returned to the session chair/co-chair for consideration as an oral paper and the author will be notified of this decision.

Technical Session Descriptions

There are 14 technical session topics listed below. Your abstract/paper should reflect the research or topics as described in the technical session descriptions provided below.

TUESDAY June 6 - Morning Sessions

TRACK A:
Protection of Vulnerable Road Users
Chairperson: Stephen Ridella, U.S.
Co-Chair: Bernie Frost, UK

Protection of children and pedestrians from injury due to crashes continues to attract worldwide attention. For children, new test procedures for assessing child side impact performance, proposed use of child dummies in consumer vehicle test programs, and new research into rear seat performance in crashes has raised considerable attention to child safety issues. Papers for the child safety portion of this session should focus on these issues, methods or data that can further the protection of children in vehicles.
Pedestrian protection has been the focus of research worldwide in recent years. Much progress has been made in this area but additional challenges remain. Attention has also been placed on improving the frontal structure of passenger vehicles to mitigate head injuries and improving lower extremity injuries. Many consumer metric programs have implemented rating systems to encourage deployment of these crash mitigation solutions. Despite these efforts, pedestrian safety continues to be a serious problem in several countries. Papers are invited in this session focused on crashworthiness solutions being designed and offered to address the many issues faced by pedestrians, bicyclists, and other vulnerable road users.

**TRACK B:**
**Safety Performance in Frontal Crashes**  
*Chairperson: Stephen Summers, U.S.*  
*Co-Chair: Younghan Youn, Korea*

Despite reductions in overall crash related death and injury, frontal impact continues to result in the highest numbers of fatalities and injuries. Car and truck manufacturers have made significant improvement in crash protection over the last four decades, however, new test requirements continue to challenge occupant safety in frontal crashes. Changing vehicle fleet characteristics in response to new fuel efficiency requirements will also challenge manufacturers to seek new materials and manufacturing methods that can manage crash energy while reducing mass. The focus of this session is on how vehicle characteristics, such as size, stiffness and weight affect the restraint parameters and the overall impact on occupant protection and crash compatibility. Papers are invited to discuss safety issues for frontal crash protection that are being investigated through modeling, testing or data analysis. Session papers may also include various aspects of frontal crash compatibility, full frontal and oblique safety countermeasures, test devices, test procedures and performance requirements.

**TRACK C:**
**Crash Avoidance #1: Advanced Driver Assistance Systems: Product Evolution; Evaluation; and Real-World Deployment Challenges**  
*Chairperson: Anders Lie, Sweden*  
*Co-Chair: Robert Kreeb, U.S.*

Advanced Driver Assistance Systems (ADAS) are continuing to advance in both capability and market share with systems proliferating across product lines from luxury to value-focused brands—and even becoming standard equipment in some models. Such systems include longitudinal and lateral warning systems (such as forward and rear collision warning, lane departure and blind-spot warning, and pedestrian detection), and active safety systems (such as automatic emergency braking, dynamic brake support, lane keeping assist, and automatic rear braking). Developing and deploying ADAS systems in today’s marketplace however often involves balancing safety performance, customer acceptance, cost, and vehicle integration considerations. Vehicle manufacturers and suppliers are examining advanced ADAS technologies and concepts to balance desired system attributes while avoiding potential negative consequences (such as distraction, false positives, or over-reliance), while achieving required customer and market acceptance through system performance calibration. In parallel, regulators and safety advocacy organizations are working to develop objective test procedures, better understand relationships between test-track performance and real-world effectiveness, and estimate benefits of each technology in isolation, and when integrated into holistic systems.
Papers are invited on research related to: ADAS system development tools and methods; balancing design tradeoffs to meet customer satisfaction and safety goals; deployment, customer education and maintenance considerations; performance demands and sensor selection and integration; controlled test procedures and performance ratings; evaluating real-world customer use and satisfaction; long-term adaptation and reliance issues; estimates of potential safety benefits; as well as other vehicle integration, testing, performance rating, future product development and customer use considerations.

**TUESDAY June 6 – Afternoon Sessions**

**TRACK A:**
**Biomechanics #1: Advances in Experimental and Mathematical Biomechanics and Injury Research**  
*Chairperson: Matthew Craig, U.S.*  
*Co-Chair: Rainer Hoffmann, Germany*

The study of injuries associated with motor vehicle crashes begins with detailed field data analysis to support an enhanced understanding of the factors associated with injury outcomes. Given field data observations related to injury causation and associated injury mechanisms, there is frequently a need for the development and application of physical and mathematical tools such as advanced test dummies and detailed mathematical models of humans. This technical session seeks papers that address: (1) advances in assessing patterns and causation of injuries in the real-world cases; (2) experimental and analytical studies addressing human response and injury mechanisms; (3) collection/application of new experimental or geometric data in the development of human body models or advanced test dummies including considerations for human variability in anthropometry, stature, age and injury tolerance; (4) application of accident reconstruction methods that account for variability in anthropometry, posture, response, and injury tolerance; and (5) application of human body models in the development of advanced/adaptive vehicle safety systems.

**TRACK B:**
**Safety Performance in Side Impact and Rollover Crashes**  
*Chair: Suzanne Tylko, Canada*  
*Co-Chair: Mark Terrell, Australia*

Side impact crashes continue to account for a large percentage of crash fatalities and injuries worldwide. The introduction of improved side impact test dummies will continue to challenge the vehicles’ response in side impact crashes. Additionally, while advanced vehicle control and safety technologies have been introduced into a large segment of the new vehicle fleet, rollover related deaths still represent a significant portion of the overall fatalities. This session is inviting papers related to understanding considerations for new test dummies, performance measures, and the changing worldwide crash environment. The session may also discuss countermeasures to reduce the occupant risk of injury in side impact or rollover crashes.

**TRACK C:**
**Crash Avoidance #2: Driver Monitoring Systems and Driver-Vehicle Interface Design for Advanced Driver Assistance Systems**  
*Chairperson: Peter Burns, Canada*  
*Co-Chair: Chris Monk, U.S.*

The success of Advanced Driver Assistance Systems (ADAS) will partly depend on the quality of driver-vehicle interface and the system’s ability to monitor the driver’s state of attention and engagement with the driving task. Crash avoidance systems and other safety
functions have been implemented with a wide range of driver-vehicle interfaces—auditory alerts, haptic alerts, visual alerts, and many combinations of those three. Data that identifies which driver-vehicle interface characteristics make warnings more effective is needed to support and guide the design of these systems. In addition, crash avoidance technologies could adjust warning parameters when drivers are identified by detection technologies as being disengaged, distracted, drowsy, or otherwise impaired. In addition, automated systems could take advantage of “knowing” the driver’s state in terms of transition of control back to the driver. The development of monitoring technology is important, as are the development of human factor principles and evaluation methods for their application to ADAS and automated systems.

Papers are invited on research related to the driver-vehicle interface for crash avoidance systems, driver monitoring technology, driver behavior and engagement patterns, fatigue or drowsiness, distraction, and other impairments, and how they relate to ADAS and automated systems.

**Wednesday June 7 - Morning Sessions**

**TRACK A:**  
Biomechanics #2: Advances in Crash Test Dummies, Instrumentation and Data Analysis  
Chairperson: Kevin Moorhouse, U.S.  
Co-Chair: Philippe Vezin, France

New or improved crash test dummies are continuously being developed for various crash mode applications. This development includes considerations for new analytical techniques to evaluate and improve dummy biofidelity. The WorldSID and THOR dummy families are in final development, while other new dummies such as BioRID and advanced child dummies are being considered for widespread use. The application of these new dummies is preceded by assessments for biofidelity, durability, repeatability and reproducibility of the respective dummies and often is accompanied by considerations for use of novel/new designs and use of new materials. Finally, mathematical models of dummies continue to improve. Technical papers are invited to discuss new dummies and improvements to existing dummies, as well as related instrumentation and analytical techniques that are under development to address future safety needs for vehicle design, testing, and restraint system development.

**TRACK B:**  
Restraint System Design and Performance Challenges: Addressing the Needs of Diverse Populations (Age, Gender, Stature)  
Chairperson: Riske Meijer, The Netherlands  
Co-Chair: Lotta Jakobsson, Sweden

Vehicle restraints in frontal crashes are only slightly more than 50 percent effective in preventing fatalities. Occupant protection can be improved through the development of advanced restraint systems that can consider occupant characteristics such as age, gender, size and posture, as well as the anticipated crash characteristics. Concerns also exist for restraint design with respect to future vehicles that may be smaller and/or lower in mass to improve fuel efficiency. The aging population will be an increasing consideration for restraint design. Adaptive protection systems will be needed to optimally protect an increasingly vulnerable driving population. The safety for rear seating positions has not had the same improvement as the front seats. These issues are receiving the attention of safety researchers world-wide. Papers are invited on research related to safety performance for
new vehicle and restraint designs especially as they pertain to older occupants, small females and heavier populations.

**TRACK C:**
**Crash Avoidance #3: Enhancing Safety with Connected and Automated Vehicles**  
Chairperson: Tim Johnson, U.S.  
Co-Chair: Jost Gail, Germany

The world is at a historic turning point for automotive travel. Motor vehicles and drivers’ relationships with them are likely to change significantly over the next several years, perhaps more than they have changed in the last one hundred years. Recent and continuing advances in automotive technology, sensors, vehicle communications and computing are taking automated and fully connected vehicles out of the laboratory and test tracks and into the hands of everyday drivers. These innovations and developments have created completely new possibilities for improving highway safety, increasing environmental benefits, expanding mobility, and creating new economic opportunities for jobs and investment. They may even change the fundamental models for vehicle ownership and use. But there are also substantial technology, regulatory, economic, and marketing challenges for introducing these paradigm-shifting technologies into the marketplace.

This session is inviting papers that describe cutting edge research related to highly automated and connected vehicles, with a focus on new innovations, approaches and technologies that would enable limited self-driving or full self-driving vehicles. Papers related to addressing key challenges for automation are also encouraged including: developing driver-vehicle interface strategies for differing levels of automation; customer education and potential for misuse of less-than-full automation concepts; driver monitoring strategies to support automation; need for special or tailored driver licensing requirements; fail-safe designs; sensor and system redundancy considerations; infrastructure requirements to support automation; liability and ethical considerations for control system programing; on-board data collection system access, ownership and privacy considerations; and other issues related to the development and deployment of safe, effective automated vehicles.

In addition, papers that address connected vehicle deployment considerations are also encouraged including: test and evaluation methods to ensure compliance with prevailing standards or proposed regulations; communications congestion and related spectrum availability issues; developing and implementing misbehavior detection at the local (vehicle) and global (infrastructure) levels; and, challenges for establishing, operating, regulatory oversight, and governance of a communications security system to ensure trusted messaging among participants in the connected vehicle eco-system.

In addition, this session is inviting papers addressing the role of the vehicle, infrastructure and associated tradeoffs related to connected and automated systems.

**WEDNESDAY June 7 – Afternoon Sessions**

**TRACK A:**  
**Student Safety Technology Design Competition, Finalist Oral Presentations**  
Regional Competition Coordinator: Art Carter U.S.

**TRACK B:**  
**Consumer Information Approaches To Improve Global Safety**  
Chairperson: Andre Seeck, Germany  
Co-Chair: David Ward, UK
In recent years, consumer information programs have become widely accepted in the U.S., Europe, Japan, Australia, Korea, China, Latin America and other countries for conducting light vehicle safety evaluations and providing vehicle safety ratings to the general public. The motor vehicle industry improves safety performance of vehicles as it strives to receive the highest rating possible for their vehicles. In addition to assessing occupant crash safety, programs are now giving credit for advanced crash avoidance systems and providing an overall rating for a motor vehicle. While testing strategy varies from region to region, the programs all strive for similar outcomes, and safer vehicles. Papers are invited on research on NCAP rating and other testing strategies and on the development of NCAPs in newly motorizing regions. Additionally, papers relating to crash avoidance evaluation approaches and overall vehicle scores and their impact on marketing safety and real world safety performance are encouraged.

**TRACK C:**  
**Electronic Systems Safety – Cybersecurity and Reliability**  
Chairperson: Cem Hatipoglu, U.S.  
Co-Chair: Terunao Kawai, Japan

The use of electronics in automobiles is a rapid ongoing progression. Electronic systems enable safer and more fuel-efficient vehicles. Electric and hybrid vehicles could not have been developed and produced without the extensive use of electronics and proven safety technologies such as electronic stability control and automatic emergency braking. Over time, electronics use has accelerated and this trend is expected to continue as the automotive industry develops and deploys even more advanced automated vehicle features. This trend results in increased complexities in the design, testing, and validation of automotive systems. They also raise general concerns in the areas of cybersecurity, functional safety, and safety assurance of growingly networked vehicles leveraging electronics.

This session is inviting papers that describe cutting edge research related to addressing new challenges, such as cybersecurity (system intrusion detection, secure gateways, software safety assurance and validation, over the air updates, etc.), and electronic systems reliability (functional safety, enhanced data logging to capture faults from complex electronic system, intelligent vehicle health monitoring, etc.).

**Thursday June 8 – Morning Sessions**

**TRACK A:**  
**Clearing the Regulatory & Enforcement Hurdles of New Technology**  
Chairperson: Jerzy Kownacki, Poland  
Co-Chair: Wayne McKenzie, U.S.

As the changes to technology continue to occur, regulatory and enforcement agencies face significant hurdles in keeping up with this ever increasing pace. These new technologies often challenge and muddle what traditionally were long established categories and definitions of automotive components. This session seeks to highlight and identify these issues and present how regulatory agencies around the world are approaching the task and what is currently being done in this area.

We invite papers that discuss how regulatory and enforcement agencies are addressing the considerable tasks of researching, testing, constructing and enforcement of laws and standards pertaining to new and emerging automotive technologies.
**TRACK B:**
Integrated Safety from Pre-Crash to Crash to Post-Crash
Chair: Bernd Lorenz, EEVC
Co-Chair: Jac Wismans, The Netherlands

This session seeks papers regarding research on new safety systems that can anticipate and react to potentially hazardous situations across the entire crash spectrum. These systems are aware of the environment around and within the vehicle and can possibly inform/adjust and/or intervene with other systems in the vehicle through fusion of sensor input and communication between systems. For example, a forward looking radar sensing potential objects ahead may result in actuation of different steering and/or braking maneuvers, and even pre-activate restraints or other passive safety devices depending on the radar information as well as occupant position or other occupant factors. Post-crash telematics could inform first responders of specific vehicle and occupant factors that would assist in triage and level of response. Papers are sought to describe systems under development, opportunities for sensor fusion, system readiness, cost, reliability, and performance.

**TRACK C:**
Assessment of New and Improved Field Data Collection, Analysis and Benefits Assessment Methods
Chairperson: Claus Pastor, Germany
Co-Chair: Tina Morgan, U.S.

Use of field crash data helps to stimulate all aspects of vehicle safety from research to policy to regulation. These data also play a leading role in development of crash prevention and crash protection countermeasures. However, due to the increase in crash avoidance technologies, the collection and analysis of these technologies needs to evolve to understand the real-world performance and to quantify the benefits and limitations of these technologies. Data on close calls or near miss crash events will be needed. Also, several naturalistic studies and testing of self-driving vehicles are in progress in various regions of the world that will provide additional insight into how crashes occur, providing additional information on how to prevent motor vehicle crashes. Worldwide, data collection programs in Asia, Europe, Australia and the U.S. are being used more to drive research and policy decisions. This session invites papers aimed at a discussion of future data collection and analysis methods. Papers related to such topics as event data recorders, naturalistic driving data on human-vehicle performance, crash avoidance technologies and all levels of autonomous vehicle actions, analytical methods for estimating potential benefits of safety technologies, evaluation methods of video data, universal descriptions of crash causal factors and resulting crash types, crash reconstruction and other related topics are welcome in this session.
25th ESV Conference - Abstract/Paper Submission Deadlines

Call for Peer Review Abstracts

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<tr>
<td>July 1, 2016</td>
<td>Call for Abstracts begins</td>
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<tr>
<td>August 19, 2016</td>
<td>Deadline for Peer Review abstract submission</td>
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<tr>
<td>September 30, 2016</td>
<td>Notification on Peer Review abstract status (1st acceptance)</td>
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Peer Review Final Paper Submission

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<tr>
<td>December 16, 2016</td>
<td>Deadline for first draft Peer Review paper to Taylor &amp; Francis</td>
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<td>December 16, 2016-February 23, 2017</td>
<td>Authors Work with Taylor &amp; Francis Editors to refine the Special Edition of ESV Peer Reviewed Papers (2nd Acceptance)</td>
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<td>February 23, 2017-March 31, 2017</td>
<td>Peer Review Papers not in the 2nd Acceptance Group notified to reformal Paper to ESV paper specifications and submit on MIRASMART site</td>
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<td>March 31, 2017</td>
<td>ALL Rejected Peer Review Final Paper Due on MIRASMART site</td>
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Call for Traditional Abstracts

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<td>July 1, 2016</td>
<td>Call for Abstracts begins</td>
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<td>October 4, 2016</td>
<td>Deadline for Traditional abstract submission</td>
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<td>November 22, 2016</td>
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Traditional Final Paper Submission

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<td>December 10, 2016</td>
<td>Site Open for Final Traditional Paper submission</td>
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<tr>
<td>March 31, 2017</td>
<td>Deadline for Final Traditional Paper &amp; Government Status Reports</td>
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What’s the difference between Peer Review and Traditional Abstracts?

Peer Review abstracts undergo a more rigorous review and editing process, and may be published in a special issue of the journal, Traffic Injury Prevention, which will feature approximately 15 papers from the 25th ESV Conference. It takes longer to complete the peer review process, requiring the earlier timeline. Abstracts/papers submitted to the peer review process, but not selected to be published in Traffic Injury Prevention will be returned to the Traditional abstract/paper submission process.

Traditional abstracts/papers undergo a lesser degree of review and are presented at the conference and published in the conference proceedings.