

Breakout Session Title

Safety Assurance of Automated Driving

Session Logistics

Date: Tuesday 28.07.2020, Wednesday 29.07.2020 and Thursday 30.07.2020

Time: 5 Breakout Session Slots

Room: Virtual Meeting

Organizers

Lutz Eckstein, Univ.-Prof. Dr.-Ing., RWTH Aachen University, Institute of Automotive Engineering (ika), Aachen, Germany

Adrian Zlocki, Dr., Director of Automated Driving at fka GmbH, Aachen, Germany

Session Description

Safety Assurance of Automated Vehicle is a required research area for introduction of automated driving. The session will focus on current projects around the globe succeeding the German PEGASUS project which established a scenario-based methodology. The methodologies, but also the safety reference for automated vehicles, need to be discussed and harmonized. This offers the chance to leverage synergies for international stakeholders, and is also necessary in order to prepare international standards defining a reasonable state of the art.

Goals/Objectives/Outputs*

Goals:

- *Provide a state of the art on current activities and initiatives*
- *Present, exchange and combine methodologies for safety assurance*
- *Discuss a suitable reference for safety of automated vehicles*
- *Synchronization of approaches on a global scale*
- *International harmonization*
- *Identify further research and harmonization needs*

Outputs:

- *Identification of international progress being made in safety assurance*
- *Comparison of requirements on safety of automated vehicles*
- *Creation of an overview on national and international projects on safety assurance*
- *Sharing of best practices on safety assurance and lessons learned*
- *Fostering the interaction between participants and speakers from industry, universities and governmental bodies*
- *Contribution to Harmonization on international level*

***Goals/Objectives/Outputs may not be fully achieved due to the digital format of the session, which does not allow conventional discussion among all participants**

AVS2020 Symposium: Breakout Session Web-Descriptions

Agenda

- 5 Sessions on three days as numbered in the following table:

Time			27.07.2020	28.07.2020	29.07.2020	30.07.2020
PDT	CET/MEZ	Tokyo	Monday	Tuesday	Wednesday	Thursday
5 – 7 am	14 – 16 pm	21 – 23 pm		1	3	5
7 – 8 am	16 – 17 pm	23 – 24 pm				
8 – 9 am	17 – 18 pm	0 – 1 am				
9 – 10 am	18 – 19 pm	1 – 2 am				
10 – 12 pm	19 – 21 pm	2 – 4 am				
12 – 1 pm	21 – 22 pm	4 – 5 am				
1 – 3 pm	22 – 24 pm	5 – 7 am		2	4	
3 – 4 pm	0 – 1 am	7 – 8 am				

Day 1: State of the art and updates from projects and initiatives

Tuesday, July 28, 5:00 AM – 7:00 AM PDT – Session 1

- 5:00 AM – 5:30 AM Introduction by Lutz Eckstein (ika), Adrian Zlocki (fka)
- 5:30 AM – 6:50 AM Dedicated activities on Safety Assurance Methodology, Moderator Lutz Eckstein (ika), Adrian Zlocki (fka)
 - Speakers (15 min each + 5 min Q&A):
 - H. Schittenhelm (Daimler): Results from the PEGASUS family projects
 - R. Galbas (Bosch): German Project V&VMETHODS
 - S. Taniguchi (JAMA): Update on Japanese activities, SAKURA
 - H. Hungar (DLR): Introduction to SetLevel4to5
- 6:50 AM – 7:00 AM Wrap up by Lutz Eckstein (ika) and Adrian Zlocki (fka)

Tuesday, July 28, 1:00 PM – 3:00 PM PDT – Session 2

- 1:00 PM – 1:15 PM Introduction by Lutz Eckstein (ika), David LeBlanc (UMTRI)
- 1:15 PM – 2:15 PM International initiatives and activities, Moderator: Lutz Eckstein (ika) and David LeBlanc (UMTRI)
 - Speakers (15 min each + 5 min Q&A):
 - P. Koopman (CMU): UL 4600
 - E. Straub (SAE): best practice to address the process of developing assessment metrics
 - A. Etemad (VW): L3Pilot
- 2:15 PM – 2:50 PM Discussion

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- o Moderation: Lutz Eckstein (ika) and David LeBlanc (UMTRI)
 - P. Koopman
 - R. Galbas
 - S. Taniguchi
 - A. Etemad
 - E. Straub
 - H. Schittenhelm
- **2:50 PM – 3:00 PM Wrap up Day 1 by Lutz Eckstein (ika), Adrian Zlocki (fka) and David LeBlanc (UMTRI)**

Day 2: Safety Level and Methodology

Wednesday, July 29, 5:00 AM – 7:00 AM PDT – Session 3

- **5:00 AM – 5:10 AM Introduction by Lutz Eckstein (ika) and Larry Head (University of Arizona)**
- **5:10 AM – 6:10 AM Measurable safety – how to quantify and communicate safety, Moderator: Larry Head (University of Arizona)**
 - o Speakers (15 min each + 5 min Q&A):
 - G. Amid (Foretellix): Coverage-driven verification of highly automated vehicles
 - R. Razdan (Florida Polytechnic University): Models, Legal Liability, and the path towards communicating AV Safety
 - A. Bin-Nun (Aptiv): Assessing the safety of AV driving behavior
- **6:10 AM – 6:55 AM Reference for Safety: Models and Driver Modelling, Moderator: Lutz Eckstein (ika), Larry Head (University of Arizona)**
 - o Speakers (10 min each + 5 min Q&A):
 - D. Becker (ika): ika's generic Driver Model for AD Safety Reference
 - D. Leblanc (UMTRI): Specific models of safe driving
 - J. Whishart (Exponent)- Driving Safety Performance Assessment Metrics
- **6:55 AM – 7:00 AM Wrap up by Larry Head (University of Arizona) and Lutz Eckstein (ika)**

Wednesday, July 29, 1:00 PM – 3:00 PM PDT – Session 4

- **1:00 PM – 1:05 PM Introduction by Lutz Eckstein (ika) and Steve Shladover**
- **1:05 PM – 1:50 PM Tools, Moderator: Lutz Eckstein (ika), Steve Shladover**
 - o Speakers (10 min each + 5 min Q&A):
 - A. Zlocki (fka) Data and scenario database and generation
 - B. Gasca (SmartDrive): Real World Data

AVS2020 Symposium: Breakout Session Web-Descriptions

- Y Yang (ASU) – Vehicle Trajectory Sensing using Existing Monocular Traffic Cameras for Safety Assessment
- **1:50 PM – 2:50 PM Frameworks, Moderator: Lutz Eckstein (ika), Steve Shladover**
 - Speakers (15 min each + 5 min Q&A):
 - B. Kreeb (NHTSA): AD Safety Framework
 - J. Weast (Intel): Metrics and Assumptions in Safety Assurance
 - M. Chaka (VTII): Overview of AMP's Suite of Tools and Real-world Driving Cases
- **2:50 PM – 3:00 PM Wrap up Day 2 by Lutz Eckstein (ika), Larry Head (University of Arizona) and Steve Shladover**

Day 3: Harmonization and Synchronization

Thursday, July 30, 5:00 AM – 7:00 AM PDT – Session 5

- **5:00 AM – 5:10 AM Introduction by Lutz Eckstein (ika) and Jane Lappin**
- **5:10 AM – 5:50 AM Safety Harmonisation, Moderator: Lutz Eckstein (ika), Jane Lappin**
 - C. Pastor (BASt): CAV - is accident avoidance sufficient as a primary safety goal?
 - F. Minarini (JRC): Safety Procedures of AD
- **5:50 AM – 6:50 AM Discussion on synchronization of approaches**
 - Introduction and Moderator: Lutz Eckstein (ika), Jane Lappin
 - Panelists:
 - C. Pastor (BASt)
 - F. Minarini (JRC)
 - M. Chaka (VTII)
 - L. Head (UAZ)
 - D. Leblanc (UJMTRI)
 - S. Taniguchi (JAMA)
- **6:50 AM – 7:00 AM Wrap up Day 3 & Conclusions by Lutz Eckstein (ika) and Jane Lappin**