



4-6 SEPTEMBER 2019

G U I D E B O O K



DSC 2019 EUROPE VR

Driving Simulation & Virtual Reality Conference & Exhibition

Palais de la Musique et des Congrès, Strasbourg | France

Organized by the Driving
Simulation Association



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DSC 2019 EUROPE VR

Driving Simulation & Virtual Reality Conference & Exhibition

The DSC Conference gathers driving simulation specialists from the industrial and academic communities as well as commercial simulation providers. This 18th edition follows that of 2018, held in Antibes, France, with close to 350 participants and 30+ exhibitors. Participants came from all around the world from about 20 different countries of Europe, America, Asia and Africa.

This year's edition will be held in Strasbourg, France, with new Product Soution sessions, more than 80 speakers and panelists as well as an extended professional exhibition.

Topics will include state of the art in driving simulation technology, research and developments, extended with progressively merging virtual reality (VR) developments. This year program will also give an enlarged place for simulation tools for autonomous and connected vehicles along with advanced driving assistance system (ADAS) applications. Human factors and motion rendering nevertheless will remain the now traditional axis of the conference.

You are welcome to the DSC 2019 Europe Conference organized by the Driving Simulation Association, in cooperation with Arts et Métiers ParisTech and IFSTTAR, with the support of Renault, and sponsored by AV Simulation, Ansys and ASAM, held on September 4th-6th!

The DSC 2019 Organizing Committee



DSC 2019 Exhibition

We are committed to bringing you the best opportunity to meet and network with many customer, prospects and partners in the field of driving simulation.

Authors, keynote speakers and delegates are attending this conference with the common aim of hearing about the latest developments in the field and will be keen to learn about your technology and services. The conference is expected to attract more than 400 attendees, which will ensure that the event has the buzz you need to generate interest in your products.

The DSC Organizing Team wishes to all participants and exhibitors a great time at the Driving Simulation Conference Exhibition 2019!



Strasbourg Conference Center

20, place de Bordeaux, 67000 Strasbourg, France



WiFi hotspot : dsc2019 // Password : pmc2019



Organizing Committee



Andras Kemeny | *Conference chair*

President, Driving Simulation Association
Associate Professor, Arts et Métiers
Expert Leader, Immersive Simulation & Virtual Reality, Renault
Director, Laboratory of Immersive Visualization Renault-Arts et Métiers



Florent Colombet | *Program Co-Chair*

Treasurer of Driving Simulation Association
Research Engineer, Renault



Frédéric Merienne | *Program Co-Chair*

Driving Simulation Association
Professor, Arts et Métiers
Director of Image Institute, Arts et Métiers



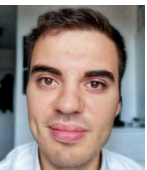
Jean-Rémy Chardonnet | *Program Co-Chair*

Driving Simulation Association
Assistant professor, Arts et Métiers



Lucile Frugier | *Conference Assistant*

Driving Simulation Association
Intern, Renault



Antonio della Volpe | *Conference Assistant*

Driving Simulation Association
Intern, Renault

Scientific Committee

The Scientific Committee, chaired by Andras Kemeny, is composed of scientists from leading Research Institutes, as well as engineers from prominent companies and major car manufacturers spread across Europe, the United States, and Canada.

Chairman

Andras Kemeny	Renault, Arts et Métiers (France)
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Scientific Committee Members

Mohammad Bahram	BMW Group R&T (Germany)
Gerd Baumann	FKFS (Germany)
Jost Bernasch	The Virtual Vehicle (Austria)
Mike Blommer	Ford Motor Co., (United States)
Erwin R. Boer	Entropy Control Inc. (United States)
Heinrich H. Bühlhoff	Max Planck Institute (Germany)
Viola Cavallo	IFSTTAR (France)
Frank Cardullo	State University of NY (United States)
Jean-Rémy Chardonnet	Arts et Métiers (France)
Florent Colombet	Renault (France)
George Drettakis	INRIA (France)
Stéphane Espié	IFSTTAR (France)
Zhou Fang	Renault (France)
Peter Grant	University of Toronto (Canada)
Jens Häcker	Daimler AG (Germany)
Franck Mars	IRCCyN (France)
Stéphane Masfrand	PSA Peugeot Citroën (France)
Frédéric Mérienne	Arts et Métiers (France)
Arne Nåbo	VTI (Sweden)
Jean-Christophe Popieul	Valenciennes University (France)
Paolo Pretto	Virtual Vehicle (Austria)
Hans-Peter Schöner	Driving Simulation Association (Germany)

Keynote Speakers

Keynotes are historically inspiring talks given by eminent scientists in the field of driving simulation, completed now by important industrial executives.



Mr. John Redford | *VP, Five AI*

“Using Simulation in the Safety Assurance of Autonomous Vehicles”



Mr. Thierry Joubert | *President, co-founder, CTO, Theoris*

“Embedded driving simulation”



Dr. Jean-Marc David | *Expert Leader Artificial Intelligence, Renault*

“Big Data and AI for Autonomous Vehicles”



Mr. Bernard Dion | *CTO, ANSYS Systems Business Unit*

“Combining Driving Scenarios Analytics and Simulation for Safe Automated Driving Development”



Mr. Emmanuel Chevrier | *CEO, AV Simulation*

“Industry trends and accelerators with AVSimulation”



Mr. Sébastien Loze | *Industry Manager, Simulations, Epic Games – Unreal Engines*

“Driving simulated, for machine learning and drivers training”



Mr. Jonathan Hogins | *Lead Engineer, Autonomous Vehicles @ Unity*

“Opportunities in real-time 3D autonomous driving simulations”



Mr. Marc Pajon | *Expert Leader Testing & Validation Technologies, Renault*

“From Assistance to Autonomous Driving : New validation challenges”

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Through multiple interfaces, Cruden's Panthera simulator software integrates with your ADAS/AD features development tools.

- 🔥 The driver: Industry-leading low system latency, accurate, realistic simulator feedback and authentic driver behaviour is guaranteed thanks to the integration of visuals (on multichannel projection systems or HMD), control-loading, motion and audio.
- 🔥 The tire model: Supporting various road definition formats, including LiDAR, OpenCRG and OpenDRIVE .
- 🔥 ADAS/AD controller: Includes ground truth sensor feed, V2V data stream for ego and traffic vehicles, realistic video streams for multi-function ADAS cameras and software development.
- 🔥 All levels of sensor simulation from ground truth to hardware-in-the-loop.

Wednesday, September 4th 2019**12 am** REGISTRATION**2:15 pm** CONFERENCE OPENING - *Cassin Amphitheatre*

Pr. Andras Kemeny, Conference Chair | *President, Driving Simulation Association, Expert Leader Immersive Simulation & VR, Renault, Director, LiV Renault-Arts et Métiers*

2:30 pm KEYNOTE - *Cassin Amphitheatre*

“Using Simulation in the Safety Assurance of Autonomous Vehicles” - Mr. John Redford | *VP, Five AI*

3 pm 3 ROUND TABLES at choice

I/ Simulation data interface standardization and HPC for Autonomous Vehicles - *Cassin Amphitheatre*

Validation of the autonomous vehicle needs several billion of kilometers driven to reach the required reliability in terms of safety. Simulation is admitted as a key solution to achieve this aim. This roundtable covers the main questions below asked actually on this topic :

- Why should we use massive simulation?
- What are the standardization using benefits in simulation?
- What are the current standards could already be used in simulation? What are the arising standards ?
- Which are important (openDrive, openScenario, OpenCRG, OSI, NDS, ...)?
- How do standards develop? How are they supported? Who does the work? how is this financed?
- What are the ongoing works to include the virtual testing in regulation?

*Dr. Klaus Estenfeld (ASAM) - Mr. Jochen Köhler (ZF)
Mr. Carlo Van Driesten (BMW Group) - Mr. Gilles Gallée (ANSYS)
Mr. Thomas Nguyen (AV Simulation) - Mr. Alain Piperno (UTAC)
Mr. Aditya Sharma (Microsoft)*

Moderated by Dr. Hakim Mohellebi (Renault)

II/ VR & AR – HMD vs. CAVE for automobile HMI engineering design - Amsterdam Room

With the recent advent on the market of low cost VR/AR devices and especially of helmets, industry tries to appropriate these technologies without necessary hindsight on them in conjunction with the applicative context. Currently, two main VR devices are used for many years by large companies: CAVE immersive rooms and head-mounted displays, the latter being more known and widespread. Though they oppose each other on several aspects, they complement each other on other aspects and one may not be necessarily favored against the other.

This round table aims at on one hand recalling the definition and the differences between both systems, and on the other hand better identifying their usage in conjunction with the applicative context, here automotive HMI engineering design, to provide to the participants enough necessary hindsight on the choice of VR technology for their own needs.

Dr. Pascaline Neveu, Armed Forces Biomedical Research (IRBA)

Mr. Stéphane Regnier (Renault)

Pr. James Oliver (Iowa State University)

Mr. David Nahon (Dassault Systèmes)

Moderated by Dr. Jean-Rémy Chardonnet, Arts et Métiers

III/ Operational standards for Driving simulator experiments - Rome Room

When designing driver-in-the-loop simulator experiments, numerous technical as well as experimental aspects are of fundamental importance. Guidelines that allow for comparability and transferability of experimental results collected in different simulators are still to be defined. There are no established procedures for classification or certification of the wide range of technical systems and different operational approaches.

The discussion aims to bring together researchers, users and developers to define a road map and establish guidelines or standards for driving simulator experiments.

Dr. Catherine Pons-Himbert, BIOPAC - Mr. Omar Ahmad, NADS

Dr. Florent Colombet, Renault - Mr. Marcus Hewat, AV Simulation

Dr. Paolo Pretto, Virtual Vehicle

Moderated by Dr. Jens Haecker, Daimler

Wednesday, September 4th 2019**4:30 pm** BREAK**5 pm** INDUSTRIAL PITCHES - Cassin Amphitheatre

- **Dr. Adrian Simms (Anthony Best Dynamics Ltd)**
"AB Dynamics ADAS Development Tools for Simulator and Track Based Testing"
- **Philippe Baucour (AVSimulation)**
"AVSimulation: combining automotive, engineering and digital innovation"
- **Mathieu Grob (VI-grade)**
"Bridging the Gap between Testing and Simulation"
- **Jan Van Bekkum (MTS Systems Corp.)**
"Introducing E2M – Innovations in Motion technology"
- **Alexander-Frederic Walser (asc(s e.V.))**
"ENVITED marketplace"
- **Gabriel Nyström (SmartEye)**
"At the ForeFront of Remote Eye Tracking"
- **Véronique Maheu (D-BOX Technologies Inc.)**
"Haptics with D-BOX: The Art & Science Behind Creating Immersive Whole-Body Experiences"
- **Rik de Swart (Bosch Rexroth)**
"High Dynamic Advanced Driving Simulator"
- **Audrey Zarlenga (Antycip Simulation)**
"V2V & V2I network simulation via Exata"
- **David Morán, (Simumak)**
"Simumak: simulation & VR strategies for smarter training"
- **Matthieu Worm (Siemens Digital Industries Software)**
"DiL testing: a critical element in the AV development process"
- **Ram Mirwani (Konrad Technologies)**
"Accelerate product development using driver-in-the-loop with sensor fusion test"

6 pm KEYNOTE - Cassin Amphitheatre**"Embedded driving simulation"**Mr. Thierry Joubert | *President, co-founder, CTO, Theoris***6:30 pm**
7:30 pm Social Event with Belgian Beer offered by BARCO

Thursday, September 5th 2019

8 am

REGISTRATION

9 am

EXHIBITION opening - *Rhin Hall*

9 am

KEYNOTE - *Cassin Amphitheatre*

"Big Data and AI for Autonomous Vehicles" - Dr. Jean-Marc David |
Expert Leader Artificial Intelligence, Renault

9:30 am

PRODUCT SOLUTION SESSION
**ADAS, Autonomous and
Connected Vehicle I**
Cassin Amphitheatre

SCIENTIFIC PAPER SESSION
**Virtual Reality for Driving
Simulation**
Londres Room

9:30 am

Automatic Road Generation for
testing ADAS and Autonomous
Driving Algorithms

S. Kussmaul (TrianGraphics), M. Nierenz

Applicability of Head-Mounted
Displays in Driving Simulation

*C. Zoller (Technische Universität
Darmstadt), A. Muller, L. Eggert, H.
Winner, B. Abendroth*

10 am

Physically modelled simulation
for testing and validation

C. Hoyle (rFpro)

Seamless User Experience in
Driving Simulation Studies

*V. Ivleva (University of Bremen), G.
Zachmann, S. Holzmann, J. Venrooij*

10:30 am

Generate Automatically
Unknown Unsafe Test Cases for
Autonomous Vehicle Required by
the SOTIF

F. Trollet (ALL4TEC)

Influence of vestibular cues in
head-mounted display based
dynamic driving simulators

B. Hartfiel (Volkswagen AG), R. Stark

11 am

BREAK

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11:30 am

INDUSTRIAL KEYNOTE
SESSION

Cassin Amphitheatre

11:30 am – *Combining Driving Scenarios Analytics and Simulation for Safe Automated Driving Development*

Bernard Dion, ANSYS, CTO BU

11:50 am – *Industry trends and accelerators with AVSimulation*

Emmanuel Chevrier, CEO, AVSimulation

12:10 am – *Driving simulated, for machine learning and drivers training*

Sébastien Loze, Industry Manager, Simulations, Epic Games – Unreal Engines

SCIENTIFIC PAPER SESSION

Perception and Human Factors I

Londres Room

11:30 am – Torque-based control for more realistic hand-wheel haptics

M. Damian (Delft University of Technology), B. Shyrokau, A. Ocariz, X. Carrera Akutain

12 am – Comparison of driver conditions in automated driving systems and transition behaviours between driving simulator and in real proving ground

T. Sato (National Institute of Advanced Industrial Science and Technology (AIST)), Y. Takeda, M. Akamatsu, S. Kitazaki

12:30 am

LUNCH

1:30 pm

POSTERS - *Schweitzer Gallery*

2:30 pm

PRODUCT SOLUTION SESSION
Enhanced Immersion

Cassin Amphitheatre

2:30 pm Need for Sound – Why is sound and vibration important in a Driving Simulator ?

B. Philippen (HEAD Acoustics)

SCIENTIFIC PAPER SESSION
Training and Validation

Londres Room

Risk Assessment Score Based on Simulated Driving Session

M. Komavec (Nervtech), B. Kaluza, K. Stojmenovna, J. Sodnik

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3 pm **Procedural Environments for Automotive Simulation**

B. Biro (Almotive), E. Nagi

Motorcycle Multibody Model Validation for Human-in-the-Loop Simulation

M. Grottoli (Siemens PLM Software), F. Celiberti, A. Van Der Heide, Y. Lemmens, R. Happee

3:30 pm **BREAK**

4 pm **PRODUCT SOLUTION SESSION**
Training and Validation

Cassin Amphitheatre

SCIENTIFIC PAPER SESSION
Perception and Human Factors II

Londres Room

4 pm **DELIVR: Driver Education – Leveraging Innovation in Virtual Reality**

T. N. Coley (XPI Simulation)

Real car versus driving simulator comparison of head dynamics in emergency braking events

C. Di Loreto (Arts et Métiers), J-R Chardonnet, J. Mackenzie, J. Dutschke, A. Van Den Berg, M. Forrest, F. Merienne, B. Sandoz

4:30 pm **HAD Validation using Driving Simulator**

P. Pathrose (Visteon), K. Kshirsagar, J. Sid, R. Borse

Evaluation of a 3DOF Mid-Size Simulator Concept: A Behavioural Validation Study

A. Parduzi (BMW Group Research), J. Venrooij, M. Peller, F. Yannick, S. Marker

5 pm **KEYNOTE - Cassin Amphitheatre**

“Opportunities in real-time 3D autonomous driving simulations”
Mr. Jose De Oliveira | *Lead Engineer for Autonomous Vehicles @ Unity*

8 pm **COCKTAIL DINNER PARTY**

Restaurant A l’Ancienne Douane
6, rue de la douane 67000 Strasbourg

Friday, September 6th 2019

8 am	REGISTRATION	
9 am	PRODUCT SOLUTION SESSION ADAS, Autonomous and Connected Vehicle II <i>Cassin Amphitheatre</i>	SCIENTIFIC PAPER SESSION Motion I <i>Madrid Room</i>
9 am	Virtual Human-Centered Design Simulation Platform : Testing Driving Aids and Automated Vehicle System with Future End-Users <i>J.-C. Bornard (CIVITEC-ESI Group), T. Bellet, J. Deniel, B. Richard</i>	Objective Criteria for Motion-Cueing Evaluation <i>A. Ronellenfisch (Porsche AG), S. Dong, E. Baumgartner, H-C Reuss, D. Schramm</i>
9:30 am	Validating Functions for Autonomous Driving, Physics-Based Sensor Models <i>H. Krumm (dSPACE), C. Wiegand</i>	Evaluation of an Optimization Based Motion Cueing Algorithm Suitable for Online Application <i>F. Ellensohn (Technical University of Munich), D. Hristakiev, M. Schwienbacher, J. Venrooij, D. Rixen</i>
10 am	POSTERS - Schweitzer Gallery	
10:30 am	BREAK	
11 am	PRODUCT SOLUTION SESSION ADAS, Autonomous and Connected Vehicle III <i>Cassin Amphitheatre</i>	SCIENTIFIC PAPER SESSION Motion II <i>Madrid Room</i>
11 am	Certifying a Synthetic Environment for CAV Validation and Verification <i>J. Groenewald (University of Warwick), G. Dhadyalla, P. Hung Chan, J. Feng, K. Roberts, P. Jennings, F. Makinson</i>	Comparison Between a Filter and a MPC-based MCA in an Offline Simulator Study <i>M. Komavec (Nervtech), B. Kaluza, K. Stojmenovva, J. Sodnik</i>
11:30 am	SCANer ADAS & Autonomous Vehicle Development & Validation Platform <i>T. Nguyen (AV Simulation)</i>	Development and Applications of a Fast MPC Based Motion Cueint Algorithm <i>Z. Fang (Renault), D. Wautier, A. Kemeny</i>

12 am

LUNCH

1:30 pm

POSTERS - Schweitzer Gallery

2:30 pm

PRODUCT SOLUTION SESSION
Simulation Design and Architecture

Cassin Amphitheatre

SCIENTIFIC PAPER SESSION
ADAS and Autonomous Vehicles

Madrid Room

2:30 pm

New High-End Visual System for the Daimler Motion Based Simulator

V. Schill (VSimulation), H. Schmieder, C. Bode, T. Schulz, S. Luedemann

Non-Critical State Transitions During Conditionally Automated Driving on Freeways: comparing results from a driving simulator and a Wizard-of-Oz vehicle

C. Purucker (WIVW), D. Befelein, A. Neukum, C. Marberger

3 pm

SCANer for MCA

M. Soyer (Renault), Z. Fang, M. Hewat, P-E Kozak, D. Wautier, A. Kemeny

Lane Change Manoeuvre Analysis: inter- and intra-subject variability in lane change characteristics

C. N. Koppel (Delft University of Technology), S. M. Petermeijer, J. Van Doornik, D. A. Abbink

3:30 pm

Survey and Overview on code optimization and hardware adaptation of heterogeneous platforms (CPU vs GPU)

F. Bounini (Sherbrooke University), D. Gingras, H. Pollart, O. Chakroun

Assessment of Simulator Utility for SCS Evaluation

M. Soyer (Renault), Z. Fang, M. Hewat, P-E Kozak, D. Wautier, A. Kemeny

4 pm

EXHIBITION closing - Rhin Hall

4 pm

KEYNOTE - Londres Room

"From Assistance to Autonomous Driving : New validation challenges" Mr. Marc Pajon | *Expert Leader Testing & Validation Technologies, Renault*

4:30 pm

CLOSING REMARKS - Londres Room

The posters are presented during posters breaks in the Schweitzer Gallery

Event Discrete Flatness based Feed-Forward Control for a Full-Motion Driving Simulator based on ADAS Data

T. Miunske (FKFS, DE), C. Holzapfel, M. Kehrer, E. Baumgartner, H-C Reuss

A Real-Time Model Predictive MCA for Gantry-Tau-3R Simulation-based motion platform by incorporating Inverse Kinematic Model

M-R Chalak Qazani (Deakin University, AU), H. Asadi, S. Nahavandi

Occupant Analysis using Active Seat Belt Control in Autonomous Emergency Braking

H. J. Chu (Hyundai MOBIS, KR), J. K. Lee, T. Roh

Development of Steer-by-Wire Functions: Virtual Prototype Tests with a Driving Simulator

M. Koppers (ZF Group, DE), A. de Moll, R. Gonschorek, D. Vieker, H-D. Heitzer

Modelization of Human Risk Feeling during near-crashed situations in autonomous vehicle

C. Gandrez (Renault, FR), F. Mantelet, A. Aoussat, L. Zhao, F. Jeremie, E. Landel

Construction and Use of an Ad-Hoc Static Driving Simulator Featuring Easily Interchangeable Mock-Ups for Highway Scenarios

M. Scholtes (Institute of Automotive Engineering, DE), P. Hosten, M. El Ghaouty, A. Dueselder

A comprehensive validation system for highly automated driving

S. Weik (Elektrobit Automotive, DE), M. Schleicher, A. Mank, S. Tiedemann

Evaluation of a level 2 automated driving system prototyped in a dynamic simulator

P. Simon (Université de Valenciennes, FR), J. Floris, C. Sentouh, S. Debernard, J-C Popieul

Comparing Proving Ground and Simulation Testing for Autonomous Car Functionality

D. Behnecke (German Aerospace Center, DE), G. Temme, D. Assmann, F. Utesch, M. Mahmood, N. Wojke, D. Kathner, M. Fischer

Coupling traffic and driving simulation: new possibilities of testing autonomous driving

A. Hafner (Technische Universität Braunschweig, DE), M. Barthauer, R. Henze, F. Küçükay

A simplified semi-physical model for real-time NVH and sound simulation of electric vehicles

C. Holzapfel (University of Stuttgart, DE), M. Kehrer, A. Janeba, T. Miunske, H-C Reuss

Hector-VR: Designing a mixed reality driving simulator with minimal discomfort

M. Mortimer (Deakin University, AU), A. Eugene, S. Thomson, M. Seyedmahmoudian, B. Horan

Study of visual corrections in a dynamic driving simulator

L. Guillaume (Renault, FR), F. Colombet, D. Paillot, A. Kemeny

Assessment of acoustic comfort in electric autonomous vehicles

P. Pretto (Virtual Vehicle Research Center, AT), P. Moertl, N. Neuhuber, L. Huszar





Accelerating automotive innovation, thanks to simulation.

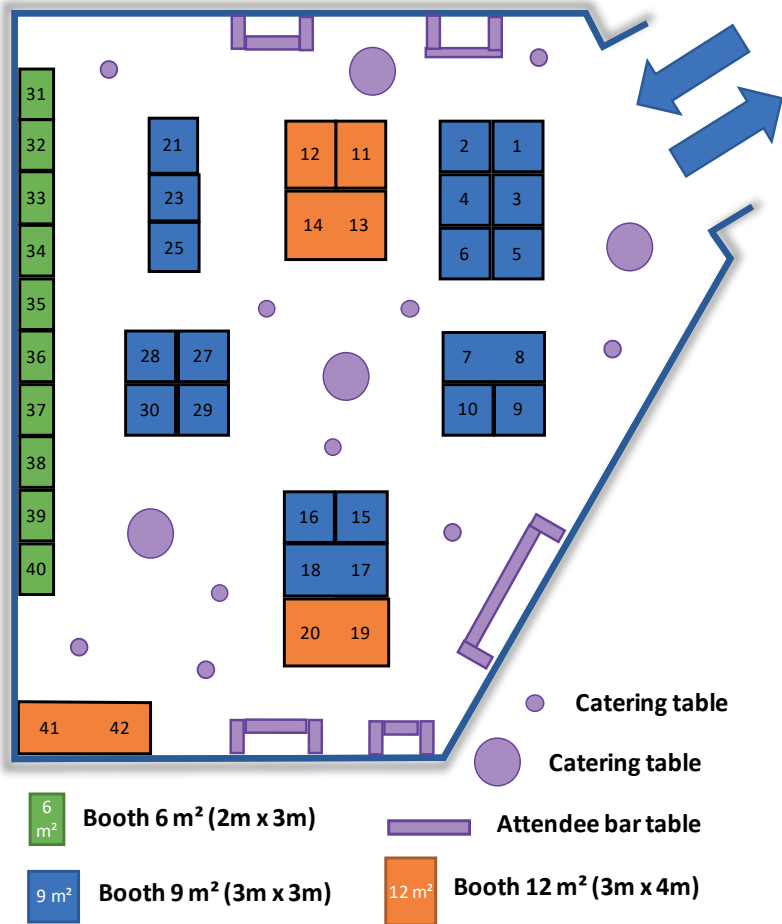
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AVSIMULATION leverages 25 years' experience and global credentials to build turnkey advanced driving simulators in line with rapidly changing requirements: headlight/night simulators using cylindric screens and high volumes of projectors, advanced simulators that encompass a complete vehicle with all equipment's : dome with visual field of up to 360°, motion platform offering the highest degree of freedom, movement restitution and total immersion.

More details on www.avsimulation.fr

Floor Plan



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■ AV Simulation	#7 & #8
■ Barco	#11
■ BIOPAC	#37
■ Bosch Rexroth	#6
■ D-BOX Technologies Inc.	#33
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■ Virtual Vehicle	#10
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ASAM e.V. (Association for Standardization of Automation and Measuring Systems) is actively promoting standardization within the Automotive Industry. Together with its more than 250 member organizations worldwide, the association develops standards that define protocols, interfaces and data models for tools used for the development and testing of electronic control units (ECUs) and for the validation of the entire vehicle. ASAM standards are applied internationally with the purpose to enable easy integration of tools into existing value chains and to enable a seamless data exchange.

In 2018, the ASAM portfolio was extended by the standards ASAM OpenCRG®, ASAM OpenDRIVE® and ASAM OpenSCENARIO®, constituting the new standardization domain "simulation". These so-called "OpenX" standards describe static road networks and dynamic driving scenarios. They are used for driving and traffic simulation and serve to validate highly automated driving systems. The OpenX standards are currently further developed within ASAM.

ASAM continues the discussion on autonomous driving, virtualized development and validation processes by dedicating this year's ASAM International Conference to the topic "Autonomous Driving – Standardized Virtual Development as the Key to Future Mobility". This biennial event which will take place on Dec 10 – 11, 2019 in Dresden, attracts more than 200 participants from the automotive industry worldwide and gives them a forum to discuss standardization needs.

www.asam.net

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The Research Institute of Automotive Engineering and Vehicle Engines Stuttgart (FKFS) – founded in 1930 – is an independent institute. About 180 highly qualified and dedicated employees perform research and development projects.

FKFS' core competences cover know-how in the areas of automotive engineering, especially vehicle aerodynamics, acoustics and wind tunnel techniques as well as vehicle dynamics, automotive powertrains both in internal combustion engines and electro mobility and automotive mechatronics including autonomous driving and intelligent vehicles.

The institute operates various highly specialized test benches and test vehicles, including several wind tunnels, Europe's largest driving simulator at a research institution, a power train test bench for hybrid and conventional vehicles as well as numerous engine test stands. Test systems for connected automotive electronics, control unit software development, development of simulators and new software tools are further focal points of the automotive mechatronics area. With its excellent infrastructure, a versatile fleet of electrified vehicles and specialized testing facilities such as the ISO15118 conformity tester, the institute is well prepared for the challenges of research into sustainable vehicle and mobility concepts.

Self-developed measuring and testing procedures enable the institute to solve complex and challenging problems. Many years of experience in the development and application of simulation tools supplement the range of services.

The foundation cooperates closely with the Institute for Combustion Engines and Automotive Engineering at the University of Stuttgart.

www.fkfs.de

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At Rexroth, we move. It's what we do since more than 200 years. And you know... we love that! That's why we will keep on moving offering solutions that are safe, efficient, intelligent and powerful. In order to keep you competitive. And that's a promise!

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The LiV laboratory (Laboratory for Immersive Visualization) is a joint laboratory between Renault and Arts et Métiers. It was founded in 2011 and gathers teams from the Immersive Simulation Center from Renault and Institut Image from Arts et Métiers, in the fields of Virtual Reality, Augmented Reality and Driving Simulation.

www.liv.institutimage.fr



IFSTTAR

IFSTTAR is a major player in the European research on the city and the territories, transportation and civil engineering.

The French Institute of Science and Technology for Transport, Development and Networks, born on January 1st 2011, from the merger of INRETS and LCPC, is a Public Institution of a Scientific and Technical Nature, under the joint supervision of the Ministry of Environment, Energy and the Sea and the ministry of higher education and research.

www.iftstar.fr



SIA SOCIÉTÉ DES
INGÉNIEURS DE
L'AUTOMOBILE

Since 1927, the "Société des Ingénieurs de l'Automobile" (Automotive Engineers Society) brings together all the specialists and enthusiasts of the automotive industry and its technologies. It has more than 1,800 individual or group and relies on a database of more than 18,000 car experts and our aim is to promote the development and knowledge sharing of engineers, managers and technicians in the automotive field.

SIA is built on its diverse communities of experts covering all areas of new technologies in product engineering as well as quality, purchasing and production from the automotive and reflects on the vast stakes of the second automotive revolution, with the 21st century in the spotlight: autonomous vehicle, hyper connected vehicle, revolution towards affordable zero emission and electrification, Big Data and cybersecurity or the emergence of artificial intelligence.

SIA is renowned in the world of automotive engineering for its conferences, workshops and congresses of international level through more than thirty annual scientific meetings. SIA participates actively in the French automotive industry in connection with the main professional organizations and on an international level as a member of the FISITA.

www.sia.fr

Exhibitors



Booth n°16

Founded in 2007 and based in Holzkirchen and Pittsburgh, USA, 3D Mapping Solution GmbH is one of the leading experts in the fields of high-accuracy kinematic surveying of public roads, proving grounds, race tracks and rough road test tracks of any kind. In addition, the high-end kinematic engineering surveying of railway tunnels or subway networks are core competences. Besides, 3D Mapping Solutions measurement data is used as basis for 3D environment modeling purposes.

For data collection, special kinematic survey systems with cameras and laser scanners are used. Essential for the exact digitalization of the 360° corridor are high-end laser scanners, a fully georeferenced high-resolution multi-camera system and a high-end inertial system for complete compensation of vehicle movement. The unique quality and accuracy of any data is a USP for 3D Mapping Solutions and guaranteed by a rigid quality management.

The focus is on providing high-end reference maps as basis for user specific developments and for advanced ADAS or autonomous driving development, testing and validation applications. 3D Mapping high-precision road surface models are used as basis for high-end simulators or simulation applications for all kinds of possible purposes in the field of virtual testing and virtual development. Therefore, 3D Mapping Solutions builds the bridge between real world and the digital twin for testing and simulation applications. High-precision as built-plans are exported into appropriate formats including all objects, attributes and the complete, complex topological structure and thus may be used directly for customer applications. Examples are the use of high-fidelity maps as in-car reference for autonomous driving developments, simulation for vehicle dynamics development and driving simulation on digital twins of complete road networks.

www.3d-mapping.de

Booth n°15



AB Dynamics is one of the world's leading specialists in automotive test systems across a wide range of applications with a strong focus on quality, support and test efficiency.

The advanced Vehicle Driving Simulator (aVDS) is a state-of-the art system designed to reduce new vehicle development timescales and costs by allowing meaningful testing far earlier in the vehicle development process. The system has a high-performance motion platform and high specification audio and visual hardware with industry-leading virtual content from rFpro. The result is a simulator capable of accurately representing the smallest changes to a vehicle's configuration and an ideal instrument for the future of vehicle development.

The family of advanced driving simulators has a solution to cater for all your vehicle simulation needs to enable virtual development of vehicles, whether it be for general automotive testing or specialised motorsport applications. Contact us today to arrange a test drive: simulatorenquiries@abdynamics.com

www.abdynamics.com



agility3

modelling and simulation

Booth n°38

Agility3 specialise in the development of virtual 3D environments for real-time driving simulation. Using commercially available tools and a variety of data sources we build custom virtual environments to meet the specific content, performance and budget requirements of our clients to support driving research, road design reviews, driver training and more.

With several years experience, our team are not only experts in producing high quality, visually realistic virtual environments but we are also able to understand the runtime requirements of your simulation software and configure the virtual environments to be compatible with those requirements. Ensuring smooth and efficient performance.

We pride ourselves on being friendly, approachable and flexible and look forward to working with you to deliver high quality virtual environments to take your driving simulation project to the next level!

www.agility3.co.uk



Booth n°27

If you've ever seen a rocket launch, flown on an airplane, driven a car, used a computer, touched a mobile device, crossed a bridge, or put on wearable technology, chances are you've used a product where ANSYS software played a critical role in its creation. ANSYS is the global leader in engineering simulation. We help the world's most innovative companies deliver radically better products to their customers. By offering the best and broadest portfolio of engineering simulation software, we help them solve the most complex design challenges and engineer products limited only by imagination.

www.ansys.com



Booth n°29

Since 1996, Antycip Simulation has supported customers across the globe, in defence, academia, commerce and industry, in becoming better at what they do. As an expert provider of simulation, analysis, modelling, display and virtual reality solutions, Antycip Simulation combines its in-house technical expertise with an unrivalled range of products from software and hardware providers. Antycip Simulation is a subsidiary of ST Engineering.

www.antycipsimulation.com

ASAM e.V. (Association for Standardization of Automation and Measuring Systems) is actively promoting standardization within the Automotive Industry. Together with its more than 250 member organizations worldwide, the association develops standards that define protocols, interfaces and data models for tools used for the development and testing of electronic control units (ECUs) and for the validation of the entire vehicle. ASAM standards are applied internationally with the purpose to enable easy integration of tools into existing value chains and to enable a seamless data exchange.

In 2018, the ASAM portfolio was extended by the standards ASAM OpenCRG®, ASAM OpenDRIVE® and ASAM OpenSCENARIO®, constituting the new standardization domain "simulation". These so-called "OpenX" standards describe static road networks and dynamic driving scenarios. They are used for driving and traffic simulation and serve to validate highly automated driving systems. The OpenX standards are currently further developed within ASAM.

ASAM continues the discussion on autonomous driving, virtualized development and validation processes by dedicating this year's ASAM International Conference to the topic "Autonomous Driving – Standardized Virtual Development as the Key to Future Mobility". This biennial event which will take place on Dec 10 – 11, 2019 in Dresden, attracts more than 200 participants from the automotive industry worldwide and gives them a forum to discuss standardization needs.

www.asam.net



Booth n°32

At atlatec, we build HAD mapping technology. We use nothing but cameras and GPS to build high fidelity 3D maps. We support our customers from the autonomous vehicle industry with best-in-class mapping technology. As well as mapping routes to be used with autonomous vehicles, atlatec provides real-world data in simulation specific formats. Static as well as dynamic objects in the environment can be imported into simulation tools.

www.atlatec.de



Booth n°12

With Audace Digital Learning, you benefit from nearly 20 years of experience in the design and production of innovative tools for human resources and operational functions of the company: support mission to the definition of the project; production of tools (e-learning, serious games, web-app, simulators ...); multilingual declension; implementation of tools on platforms (LMS); solutions for PCs, Macs, tablets, smartphones, interactive tables, multi-formats and multi-universes...

www.audace-digital-learning.fr

The asc(s) is a non-profit association for know-how carriers in the field of automotive simulation. The company provides its members with the possibility to advance new simulation methods for the virtual vehicle development fast and efficiently – particularly if these place high demands on the computing power and data volume.

The main focus of the activities is the concentration of expertise from automotive and supply industry, software and hardware manufacturers, engineering service providers and research institutes. The asc(s) provides the environment for smooth cooperations. Enterprises work hand in hand at the asc(s), thus gaining new impulses for the development of their products.

The transformation of the automotive industry is largely driven by four key trends: autonomous driving, electromobility, connectivity and sharing / mobility services. Digitalization is moving forward at a rapid pace. Value creation is increasingly shifting to the virtual development process. In the future, products will consist of a combination of hardware and digital services. This ongoing change requires new research approaches in simulation methods, consistent process chains and data processing on HPC, cloud and VR environments as well as new collaborations to master the transformation.



The ENVITED Marketplace (Environment for Virtual Test Drive) is a new format for cross-industry collaboration and technology transfer in the area of virtual development of autonomous vehicles and connected mobility systems. As a Solution Center, the Automotive Simulation Center Stuttgart e.V. has bundled and accelerated the individual activities of this process since mid-2018 and serves as an independent competence center.

The ENVITED Marketplace is divided into the three topics Data Market, Innovation Hub and Career Channel, offering the players significant competitive advantages in research and development, especially in the areas of autonomous driving, machine learning and artificial intelligence.



Booths n°7 & 8

AVSIMULATION was created in 2017, owned by OKTAL and Renault. Our customers are automakers, equipment manufacturers and universities. Our activities are twofold: The design and implementation of high-performance, turnkey simulators on the one hand, the development and commercialization of the SCANer™ studio simulation platform on the other hand. Thanks to its ability to associate more than 25 years of knowledge of the automotive industry, simulation and a complete and recognized software solution, AVSimulation is a unique player in the market!

www.avsimulation.fr



Booth n°37

BIOPAC measures physiology anytime, anywhere in providing researchers with a full range of devices to get great scientific data in real-world or VR environments.

www.biopac.com



Booth n°6

At Rexroth, we move. It's what we do since more than 200 years. And you know... we love that! That's why we will keep on moving offering solutions that are safe, efficient, intelligent and powerful. In order to keep you competitive. And that's a promise!

www.boschrexroth.com



Booth n°28

Concurrent Real-Time is the industry's foremost provider of high-performance real-time computer systems, solutions and software for commercial and government markets. Its real-time Linux solutions deliver hard real-time performance in support of the world's most sophisticated hardware in-the-loop and man-in-the-loop simulation, high-speed data acquisition, process control and low-latency transaction processing applications. Concurrent's flagship products include the SIMulation Workbench real-time modeling environment, RedHawk Linux real-time operating system with guaranteed low-latency response, and iHawk multiprocessing platforms. With over 50 years of experience in real-time solutions, Concurrent Real-Time provides sales and support from offices throughout North America, Europe and Asia. Visit <http://www.concurrent-rt.com> for further information.

www.concurrent-rt.com

D-BOX is an entertainment company powered by a unique patented motion technology with market traction records.

Started in 1998 by a group of young engineers, musicians and a powerful desire to change the landscape as to how people enjoy their movies, play video games or race on a motion simulator.

www.d-box.com



A Delta Associate Company

Booths n°41 & 42

A digital imaging pioneer and industry leader, Digital Projection manufactures an extensive and expanding line of ultra high-performance 3-chip and single-chip DLP® projection systems. These projectors are the reference standard for demanding applications such as large-venue, live-event staging, education, medical and scientific research, command and control, digital cinema, commercial entertainment, houses of worship and elite home cinema.

Multiple company accolades include two Emmy® Awards for Outstanding Achievement in Engineering Development by the Academy of Television Arts and Sciences. Digital Projection remains the first and only projector manufacturer to win the coveted award.

Prior to the launch of Digital Projection's newest product, the INSIGHT 4K HFR360, 3D technology suffered from a significant immersive limitation: each user was seeing exactly the same image, regardless of where they were positioned. Digital Projection has again moved ahead of its competitors with the INSIGHT 4K HFR 360 Multi-View 3D projector, which can finally offer truly immersive, collaborative and interactive 3D experiences.

With Multi-View 3D projection, a single projector, with ultra-fast frame rates will accommodate several viewers, each being tracked and each having a view of the image that remains appropriate to their changing position. This allows the users to see and interact with each other in a truly shared collaborative manner.

Previously, the ultra-fast frame rates required for a multi-viewer 3D system have meant sacrificing resolution – and therefore image fidelity. Digital Projection was not willing to accept such a compromise. The new INSIGHT 4K HFR 360 offers both native 4K and high frame rate – thanks to the thousands of hours invested by Digital Projection's team of experts and their unsurpassed experience in 3-chip DLP projection.

Instead of providing 120 frames per second, which is enough for single user 3D, the INSIGHT 4K HFR 360 delivers an unrivalled 360 frames per second at native 4K resolution, enabling content creators to serve three independent, high-resolution 3D views with just one projector. Furthermore, the addition of a second projector to the system increases the unique user 3D views to six.

www.digitalprojection.com

domeprojection.com® develops high-end automatic projection alignment and calibration technologies for visual display systems for professional simulation and training environments: the ProjectionTools guarantee a perfectly warped and blended projection combined with meticulously precise correction of color and black level.

Project: syntropy creates high-end visual display technologies for professional simulation- and training environments. project: syntropy offers full service and turnkey visual display solutions, fulldome systems and simulators with vibration- or motion platform.

www.domeprojection.com

dSPACE

Booth n°2

dSPACE develops and distributes integrated hardware and software tools for developing and testing electronic control units.

As a one-stop supplier, dSPACE is a sought-after partner and solution provider in many development areas of the automotive industry, from electromobility to vehicle networking to autonomous driving. The company's customer base therefore includes virtually all major vehicle manufacturers and suppliers. dSPACE systems are also used in the aerospace and other industries.

With approximately 1,700 employees worldwide, dSPACE is headquartered in Paderborn, Germany; has three project centers in Germany; and serves customers through regional dSPACE companies in the USA, the UK, France, Japan, China, and Croatia.

dSPACE is a key player for ADAS and Autonomous Driving development and test. Many dSPACE systems are being used in those domains by Automotive EOMs and TIER1s throughout the world. Visit our booth and discover our comprehensive tool suite for the design, development and test of ECUs for Autonomous Driving. See how our models and our virtual test technology are used to drive through huge numbers of scenarios. Discover comprehensive cutting edge sensor models for Camera, Radar, Lidar. Use the latest technologies to generate raw sensor data out of a real time simulations. Take that simulated raw data to bypass real sensor input on the ECU, and get your sensor ECU to react in real time to the simulated sensor input. Also more to see on: Scenario based testing, Scenario Generation, Data Logging, etc.

www.dspace.com



Booth n°30

Simumak, an everis ADS company

Since 2005, Simumak offers tailor-made solutions for the entire range of training through high-performance simulators. Thanks to its experience in the sector and its

experience in the sector and its dedicated professionals, Simumak develops 100% of the simulation solution. We work in all aspects of the simulation environment, from the design of the Software and the Hardware approach, to the development of an Integral Training Plan. In addition, Simumak invests in research and development to implement the latest technologies compatible with simulation, such as virtual reality and mixed reality. Our main objective is to create long-term partnerships based on mutual benefit, and to provide the end user with a safer, more efficient and more productive experience.

www.everis.com



FORUM8®

Booths n°13 & n°14

FORUM8 is a software house and system integrator specialized in the development and sale of highly flexible and customizable Interactive 3D VR simulation and modeling software “VR Design Studio UC-win/-Road” that brings together various vehicle models and analysis data under one roof for visualization while allowing users to quickly construct a 3D environment that can be driven around immediately; and driving simulators of all types powered by the software from basic desk-top units to the most sophisticated systems with motion platform and 8 degrees of freedom (hereafter referred to as DOF) for driver training and research on autonomous driving, human factors, and road safety as well as automotive testing custom-built to suit diverse customer needs. Automatic Steering Torque Control Driving Simulator with force-feedback steering wheel that offers highly realistic force-feedback and accurate torque control, the world’s first 4K five-screen CAVE Driving Simulator for vehicle dynamics research and development, and the 8DOF Traffic Safety simulator built on a 8DOF motion platform offering the driver 360 degrees of peripheral view are few of the many VR systems built-to-order by FORUM8. Serving an ideal integrated platform for autonomous driving, ADAS simulation, and ITS automotive research, VR Design Studio is used to look at vehicle design alternatives and its impact on traffic and environment from driver’s perspective as well as vehicle behavior based on predefined vehicle dynamics under various driving scenarios (all aspects of road traffic, including number of lanes, vehicle speed, volume and direction, as well as traffic signals and ITS signages) and environmental conditions (rain, wind, snow, time of day, shadows and streetlights and car headlights) which can all be reproduced and controlled at will. Designed to accurately replicate the real world, the software provides solutions across many areas including civil engineering, architectural design, traffic simulation, in addition to automotive research. To reach broader audience, FORUM8 invented VR-Cloud(R), the ‘cloud’ version of VR Design Studio that provide customers with interactive 3D VR solutions over the “Cloud” for proactive discussion and collaboration without the need of heavy duty hardware. As VR-Cloud(R) can host real-time VR environment created by VR Design Studio for easy and interactive on-line access by anyone with a computer, tablet, or Android Smartphone, this cloud computing solution is often used for proactive collaboration projects, the ultimate goal being to reach consensus among everyone involved in a particular project or stakeholders that could potentially be influenced by the project.

www.forum8.com

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The foundation cooperates closely with the Institute for Combustion Engines and Automotive Engineering at the University of Stuttgart.

www.fkfs.de



Booth n°3

frontload your modelling

FrontMod was founded in 2018 and is devoted to modelling ADAS sensors for automotive applications. The generation of sensor models for SIL and HIL applications and supporting clients with their EMC-validation of sensors and control units are the company's main fields of business.

By reducing test drives and relocating the sensor system validation in the laboratory, the company also wants contribute reducing emissions to protect the environment. The virtual validation of the ADAS sensors provides significantly more freedom in defining possible test cases, which themselves reduce error rates and increase robustness of autonomous driving systems.

The implementation of virtual test drives with integrated sensor functions in the laboratory are using self-produced or existing simulation tools. The area of activity includes the development of models for SIL and HIL applications, starting with specification up to the construction of test equipment. The company's goal is to accompany customers from concept design to realization and solve technological issues.

www.frontmod.de

GAZE INTELLIGENCE (GI) is a company specialized in the distribution and development of solutions for driver attention/distraction monitoring with Eye Tracking and brain activities with EEG. GAZE INTELLIGENCE offers an advanced and unique Eye tracking software for efficient and productive analysis such as automatic visual patterns analysis combined with car performances and driver physiological data.

www.gazeintelligence.com



Booth n°4

Intempora S.A. is an independent software editor founded in 2000 and based on the works performed and developed from 1998 at the Center of Robotics of Mines-ParisTech. Intempora has now almost 20 years of knowledge and expertise in providing advanced software solutions for the automotive industry, especially with real-time multisensor applications. Intempora provide RTMaps, a modular component-based development software which accelerates the design and the execution of ADAS and highly automated driving (HAD) applications and IVS – Intempora validation Suite a cutting edge software toolchain for the test, benchmarking and validation of autonomous driving algorithms including perception and deep learning. Since 2016 Intempora signed a strategic partnership with dSPACE GmbH for worldwide distribution and proposing a complete toolchain for ADAS and automated driving.

www.intempora.com



Booth n°21

As a world leader in hybrid simulation, MTS is pioneering the application of advanced technologies and methods throughout all stages of vehicle development to realize new efficiencies, reduce costs and decrease time to market. To push the boundaries of subjective evaluation, MTS collaborates closely with McLaren Applied Technologies (MAT) on the MTS Vehicle Dynamics Simulator (VDS). The VDS offers a driver-in-the-loop approach with sophisticated low-latency sensory cueing, fully integrated MIDAS test management software from MAT, and an adaptable rFpro virtual environment that employs Concurrent real-time computing to immerse test drivers in highly realistic driving scenarios. MTS also continues its pursuit of advanced methods, like Mechanical Hardware-in-the-Loop (mHIL), for integrating physical components and virtual models to enhance objective analysis and testing. Employing these methods and technologies strategically throughout vehicle development enables meaningful subjective and objective evaluation – at both the component and vehicle levels – earlier in the process, minimizing expensive late-stage rework and reducing the number of required prototypes. Visit us our booth and explore how advanced MTS simulation solutions can transform the efficiency and speed of your vehicle development program.

www.mts.com

Nervtech is a high-tech R&D company specializing in vehicle simulator technologies. It provides solutions in the fields of biometric and cognitive driver evaluation, machine learning and data integration. Nervtech's patented 4DOF-motion compact driving simulator offers a real-life driving experience for simulator analytics and driver evaluation and training. The simulation can run on a configuration with three big external screens or with VR headset (Oculus Rift or HTC Vive). It can be easily transported to any location and set-up in a very short time.

The simulation platform includes a variety of driving environments, from country side roads, snowy mountains, different highways and complex city centres. Unusual and dangerous behaviour can also be created providing critical and highly demanding driving situations and events. The platform provides also a set of ADAS elements (lane assist, emergency braking, adaptive cruise control, etc.) or fully autonomous driving.

The cockpit of the driven vehicle is displayed on the screens and can be changed/modified freely to add new dashboard or IVIS elements (head-up display, dashboard display, different types of lights and indicators). External HW components can also be integrated into the system providing new types of input modalities.

The platform includes also a set of physiological and biometrical medical grade sensors for measuring driver's signals such as HR, GSR, body temperature, pupil diameter, gaze position, etc. Proprietary algorithms for detection of distraction, stress or cognitive workload are also provided.

Nervtech's main R&D goal is to develop techniques and procedures for the transfer of knowledge from human driver to self-driving machines. Consequentially autonomous vehicles will be able to handle more efficiently complex and unpredictable driving situations by taking into account also human cognition and intuition-based decision-making.

www.nervtech.com



Established in 1997, OPAL-RT Technologies develops, and markets high performance real-time simulators used by universities, research centers and large corporations working in the automotive, aerospace, power electronics and power grid industries. Over the years, OPAL-RT has taken its place as world leaders in real-time simulation of electromagnetic systems by providing powerful simulation systems that allow users to develop or test their products or designs in a safe environment. OPAL-RT has offices in France, Germany, India, China and the United States.

www.opal-rt.com



Booth n°9

SENSODRIVE is a spin-off from the German Aerospace Center (DLR).

The company was founded in 2003 by researchers from the DLR.

SENSODRIVE is specialized in torque technology as well as in high-performance simulators.

SENSODRIVE develops and produces tens of thousands of torque sensors and torque-controlled actuators every year for renowned companies worldwide. It was the first company to launch specialized torque sensors for robot drives.

In addition to its leading role in drive technology, SENSODRIVE is known for its state-of-the-art force feedback products.

The sophisticated simulators stand out due to sensitive force feedback and impressive realism.

From the steering wheel to pedals, to rotary and push buttons, or an entire simulator cockpit – the SENSODRIVE simulators enable high-end simulations in research and development.

You're not just anybody. And our products aren't just any products.

Welcome to SENSODRIVE.

www.sensodrive.de



Booth n°33

SiFat is a leading company in driving simulations in Europe. SiFat engineers a wide variation of high end driving simulators. Their mission is to design realistic and highly exciting simulators.

www.sifat-roadsafety.de



Booth n°5

Bridging the gap between man and machine since 1999. Smart Eye develops artificial intelligence (AI) powered eye-tracking technology that understands, assists and predicts human intentions and actions.

By studying a person's eye, face and head movements, our technology can draw conclusions about an individual's alertness, attention, focus and gain insights into a person's awareness and mental status.

Today, our eye tracking technology is embedded in the next generation of vehicles, helping the automotive industry take another step towards safer and more eco-friendly transportation. Our research instruments offer unparalleled performance in complex, real-world situations, paving the way for new insights in automotive, aerospace, aviation, psychology, neuroscience, medical and clinical research.

www.smarteye.se



Booth n°34

TEA develops and supplies high-end research solutions for human behavior analysis in HMI and transportation research, for both simulation and real world studies:

- Remote and wearable eye-tracking systems,
- Wireless 3D Motion tracking sensors (IMUs) with unchallenged robustness,
- Unobtrusive wireless sensors for in-depth assessment of physiological constraints, reactions and mental load,
- Unmatched capabilities for simulation and VR with real-time logging of interactions with both vehicle and objects in the scene,
- CAPTIV software platform enabling the recording and analysis of multiple modalities (videos, measurements, VR and simulator data, etc) – all in perfect sync..

www.teaergo.com



Booth n°39

Thierry CLEMOT's company creates 3D environments for cars simulators. Real environments are created from high accuracy 3d Laser scan. Available quickly, our 200 km urban model allows us to create every exercises needed in fictive environments.

Today, our models are used by cars manufactures in the US, Asia or Europe, what about you?

www.thierryclemot.com

TRIANGRAPHICS
Intelligent Terrain Solutions



Booth n°1

Triangraphics is operating on the VIS/ SIM market and is specialized on the generation of databases for all types of realtime simulations. With their powerful proprietary software tools and their long experience in 3D Terrain Development, they are pushing the boundaries of the simulation and automotive market when it comes to detail, quality, size, efficiency and realism of digital environments.

www.triangraphics.de



Booths n°19 & n°20

VI-grade is the leading provider of best-in-class software products and services for advanced applications in the field of system-level simulation. Along with a network of selected partners, VI-grade also provides revolutionary turnkey solutions for static and dynamic driving simulation.

Established in 2005, VI-grade delivers innovative solutions for streamlining the development process from concept to sign-off in the transportation industry, and there mainly in the automotive, aerospace, motorcycle, motorsports and railway sectors. With its office locations in Germany, Switzerland, Italy, UK, Japan, China, and the USA and a worldwide channel network of more than 20 trusted partners, VI-grade is a dynamic and growing company with a highly skilled technical team.

Since September 2018, VI-grade has been part of Spectris. Spectris is an FTSE 250 listed global conglomerate with 2017 sales of over \$2B and 9,800 employees. The firm conducts business in four major segments – materials analysis, testing & measurement, in-line instrumentation and industrial controls – and serves a broad range of industries ranging from automotive and aerospace to electronics, energy, mining and pharmaceuticals.

www.vi-grade.com



Booth n°19

About Konrad Technologies Worldwide

Konrad Technologies (KT) is a global company and NI Platinum Alliance Partner that offers customized turnkey test solutions in the areas of electronics manufacturing, high-frequency technology, optics and beyond. Since 1993, Konrad Technologies has successfully developed, designed and integrated customer-specific test solutions providing customers with R&D, qualification, and manufacturing of electronic products with tools to fulfill their quality goals, accelerate engineering and development throughput. Customers in a wide range of industries from Automotive, Aerospace and Defense, Wireless Communications, Consumer Electronics, Medical, Semiconductor, General Electronic Manufacturing to Industrial Automation use KT's integrated hardware and software platform-based solutions to improve their performance worldwide. Konrad Technologies is a founding member of ADAS iiT, a consortium that provides a complete test solution for autonomous driving.

Konrad-Technologies, KT and Konrad GmbH are all representative of Konrad Technologies worldwide. Other products and company names listed are trademarks of their respective companies.

www.konrad-technologies.com

Founded in 2007, VIOSO is a leading provider of blending, warping and video mapping software solutions for system integrators and event professionals. VIOSO's patented core technology offers reliable and user friendly auto-alignment for applications where multiple projectors are required. With over 500 successful projects to date, VIOSO serves a number of specialised industries including AV integration, simulation, visitor attractions and dome projection. The company prides itself in offering the best solutions for complex visual projects.

www.vioso.com



Booth n°31

VIRE Simulationstechnologie GmbH is a member of the MSC Software Group of companies and is owned by Hexagon, a leading global provider of information technology solutions.

VIRE Simulationstechnologie, est. 1996 in South Germany, is a leading supplier of simulation solutions for development, test and validation of systems in active safety, advanced driver assist and highly automated driving applications. VIRE serves the automotive industry world-wide from OEM to component supplier level.

The company's core product, VIRE Virtual Test Drive (VTD), supports a wide range of additional tools and services.

VTD is a complete tool-chain for driving simulation applications. VTD is a toolkit for the creation, configuration, presentation and evaluation of virtual environments in the scope of road and rail based simulations. It is used for the development of ADAS and automated driving systems as well as the core for training simulators. It covers the full range from the generation of 3d content to the simulation of complex traffic scenarios and, finally, to the simulation of either simplified or physically driven sensors. It is used in SiL, DiL, ViL and HiL applications and may also be operated as co-simulations including 3rd party or custom packages. By its open and modular design it can easily be interfaced and integrated in industry generally, and helped to establish the de-facto standards OpenDRIVE, OpenCRG and – as more recently – OpenSCENARIO. OpenDRIVE has laid the foundation for the standardization of Road Networks. OpenCRG established the standard of Road Surfaces. OpenSCENARIO will define the new standard for the definition of dynamic content.

About MSC Software Group of Companies

MSC Software is one of the ten original software companies and a global leader in helping product manufacturers to advance their engineering methods with simulation software and services. As a trusted partner, MSC Software helps companies improve quality, save time, and reduce costs associated with design and test of manufactured products. MSC Software employs 1,400 professionals in 20 countries. For more information about MSC Software's products and services, please visit: <http://www.mscsoftware.com>

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Booth n°10

VIRTUAL VEHICLE is a leading international R&D center for the automotive and rail industries. The center focuses on advanced virtualization of vehicle development. This linking of numerical simulations and hardware testing leads to a powerful HW-SW whole system design and automation of testing and validation procedures. The international partner network of VIRTUAL VEHICLE consists of around 100 international industrial partners (OEMs, Tier 1 and Tier 2 suppliers as well as software providers) as well as over 40 international scientific institutions.

www.v2c2.at



Booth n°25

The Würzburg Institute for Traffic Sciences (WIVW) is a company providing research services into the human factor in the interaction between humans and technical systems, especially addressing issues arising from the automotive sector. In addition to its project work, WIVW develops and distributes the SILAB driving simulation software. Our long-standing clients in both divisions include renowned private and public organizations.

www.wivw.de



Driving Simulation Association

The *Driving Simulation Association* aims to:

- **promote and encourage driving simulation in all its aspects:** research, studies, developments, applications and products;
- **facilitate communication between people** involved or interested in driving simulation;
- **contribute to the organization of scientific conferences in the area of driving simulation**, Driving Simulation Conference (DSC) Europe, DSA seminars
- **organize special interest groups** (SIG) Driving Simulation Experience (SIGDSEP)
- **inform** about recent events new and trends

Our Donating Members



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THURSDAY

COCKTAIL DINNER PARTY

You are cordially invited to a cocktail dinner party on the September, 5th at 8 pm at L'Ancienne Douane restaurant.

The Restaurant and its Winstub immerse you in an authentic Alsatian atmosphere with its rooms decorated with woodwork, tables and chairs of Alsatian culture.



6, rue de la douane
67000 Strasbourg

20 min by Tramway or 30 min walk from Palais des Congrès

- Tramway B, from Lycée Kléber to Homme de Fer
- Tramway E, from Lycée Kléber to République

Get directions:

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