DSC

6-8 SEPTEMBER 2017

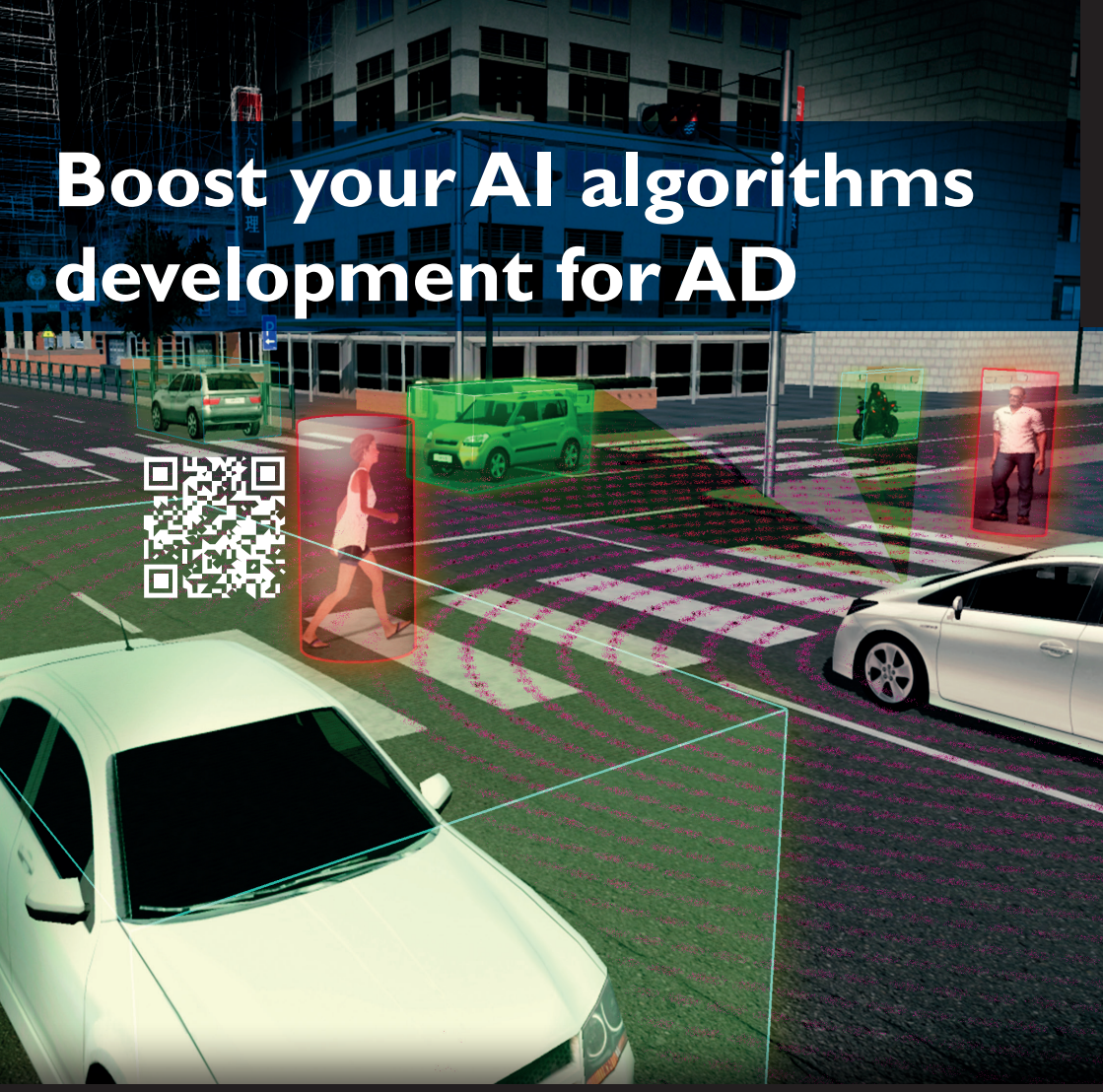
GUIDEBOOK

DSC 2017 EUROPE VR

Driving Simulation & Virtual Reality Conference & Exhibition

University of Stuttgart | Germany

Boost your AI algorithms development for AD



Boost your AI algorithms development for autonomous driving thanks to physics based driving simulations for providing information from visual & non-visual sensors like Camera, lidar, radar, or ultrasound simultaneously.
Instead of labeling real videos by hand, use the information of the simulation to feedback and correct the results of your neural network.

Trigger every frame of the simulation to capture data for further processing. Embed your algorithms within the simulation and test your AI in unusual situations, which are too risky in reality.

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DSC 2017 EUROPE VR

Driving Simulation & Virtual Reality Conference & Exhibition

The goal of the Driving Simulation Conference is to propose to academics and engineers an all-round view of the state of the art of driving simulation technology, research and development, as well recent as applications.

In this conference, with the right mix of science and industry, you have the opportunity to meet and discuss in a friendly environment with representatives of the world's leading car manufacturers and suppliers as well as major academic partners working in transportation research. As a researcher, you can present your most recent findings, rigorously peer-reviewed, and attend the presentations of other scientists working on related fields.

The DSC Europe VR attracts driving simulation professionals from industry and commercial organizations as well as research and academic environments. With a history of 15 editions, this conference has become the most important event for the driving simulation community in Europe. In 2016 the DSC has attracted about 220 participants from more than 100 research institutions and companies in 16 countries, half of them automotive manufacturers and suppliers and the interest in our conference is continuously growing.

This 16th edition is organized at the University of Stuttgart by the Driving Simulation Association, in cooperation with FKFS, Renault and Optis. It is strongly committed to the improvement of already appreciated features of the previous editions, like the variety of the topics, the presence of poster sessions, guided tours of industrial facilities and the concurrent exhibition with about 30 exhibitors, scientific and industrial keynotes.

Among the main subjects, you will learn about the new trends in driving simulator design technics and transportation research, dealing with motion rendering, visual systems and scenario tools as well as new experiments and applications in the field of human factors, automotive assistance systems and road infrastructure validation. The "ADAS, Autonomous and Connected vehicles" session with a large number of papers will be emphasized this year by both scientific and industrial Keynotes, dealing with implementation,

evaluation and testing of the Autonomous Vehicle, showing the world-wide interest of using driving simulation technics in this research and engineering area.

Conference keynotes include one on *The role of simulation in development and testing of autonomous vehicles* by Hans-Peter Schöner, Daimler and another on the *History, opportunities and challenges of road vehicle automation* by Steve Shladover, ITS Berkeley.

Industrial keynotes include *Autonomous vehicle deployment: new developments in simulation software and hardware* by David Charondiere, OKTAL, *Human factors design and validation in virtual reality for AD cockpits* by Nicolas Dalmasso, OPTIS and *The cognitive simulation of the car driver for Autonomous Driving systems development* by Jean-Charles Bornard, ESI Group.

A selection of the best papers are published in Transportation Research Journal, Part F, Special Issue in Driving Simulation. A 2-pages abstract of these papers is included in the Proceedings. In addition electronic versions of the conference papers are available on line on the Driving Simulation Association website www.driving-simulation.com from the first day of the Conference.

Thus, this DSC Europe 2017^{VR} proceedings bring again a panorama of recent developments in simulation techniques and applications for your pleasure and research or industrial professional use.

The DSC Europe 2017^{VR} Scientific Committee and the Executive Board of the Driving Simulation Association wish you a great time and good reading of the Driving Simulation Conference Europe 2017^{VR} Proceedings!

The DSC 2017 OrganizingCommittee

Exhibition

The DSC 2017 Europe organizing committee, in partnership with OPTIS, official sponsor, is offering you the opportunity to demonstrate your products and services during this conference. With the right mix of science and industry, you have the opportunity to meet and discuss with representatives of the world's leading car manufacturers and suppliers in a friendly environment.

Organized by

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ARTS ET MÉTIERS ParisTech

IFSTTAR

Exhibitors	#booth
3D Mapping	#01
Sony	#02
Biopac	#03
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Clarté	#08
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DSC 2017 EUROPE VR

Driving Simulation & Virtual Reality Conference & Exhibition

Guided tours to driving simulators

Guided tours are provided to unique facilities like the Optis Driving Simulator using Optis VRXexperience software interface with SCANeRStudio, the Daimler Dynamic Simulator and the Stereoscopic fixed base Simulator and the FKFS automated driving related studies using the driving simulator.
Attendees are assigned to groups according to their preferences indicated during the registration

Keynotes

Keynotes are historically grounded inspiring 30min talk, followed by discussion, given by eminent scientists in the field of Man-Machine Systems.
The five keynotes are given by Hans-Peter Schöner (Daimler), Steve Shladover (ITS Berkeley), David CHARONDIERE (Oktal), Nicolas Dalmasso (Optis), Jean-Charles Bornard (ESI-group)

Cocktail party

The Cocktail party takes place at "Le Méridien Stuttgart Hotel"
Willy-Brandt-Strasse 30, Stuttgart, 70173

DSC 2017 Exhibition

The DSC is again a combination of conference and exhibition, with focus on strong exhibition partners. The exhibition consists of 30 spaces, open 8:00-16:55 on Thursday and 9:00-17:00 on Friday.

The DSC team is committed to bringing you the best opportunity to meet and network with many customers, 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 new technology and services.

The DSC organizing team wishes to all the participants and exhibitors a great time at the DSC 2017 – Driving Simulation conference & Exhibition.

Organizing Committee

Andras Kemeny | Conference Chair
Expert Leader, Immersive Simulation & Virtual Reality, Renault
Director Laboratory of Immersive Visualization Renault-ENSAM
Associate Professor, Arts et Métiers ParisTech
President of Driving Simulation Association

Gerd Baumann | Program Co-chair, Local Organizer
Head of Department Automotive Mechatronics / Software
FKFS, Stuttgart

Jürgen Pitz | Program Co-chair, Local Organizer
Project Manager Driving Simulator
IVK, University of Stuttgart

Florent Colombet | Program Co-Chair
Research Engineer, Renault
Treasurer of Driving Simulation Association

Frédéric Mérienne | Program Co-Chair
Professor, Director of Image Institute
Arts et Métiers ParisTech

Jean-Rémy Chardonnet | Program Co-Chair
Lecturer | Arts et Métiers ParisTech

Jonas Jansson | Program Co-Chair
Head of Research, Research dpt Traffic and road-users
VTI, Linkoping, Sweden

Philippe Cas | Exhibition Chair
Operational Marketing Manager
OPTIS SAS
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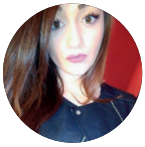
FKFS, Stuttgart

Tobias Miunske | Conference Assistant
FKFS, Stuttgart

Victor Gregorio | Conference Assistant
Intern, Renault

Chloé Riou | Conference Assistant
Intern, Renault



Marion Blanc | Marketing Specialist
OPTIS SAS
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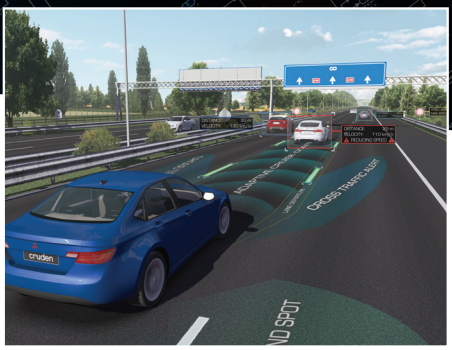
cruden

Cruden DIL simulator for ADAS controller testing



Save money, save time, conduct research more quickly

- Test controller decision-making in handover moments and emergency scenarios with real drivers in a safe, repeatable environment
- Process large numbers of different drivers through a test programme
- Evaluate algorithms more efficiently without the cost and time of going to a test track
- Test new ADAS and AV concepts long before the first prototypes are built

Introducing the Cruden ADAS-406-F3 simulator

- Highly immersive simulator with professional projection system and realistic content
- Accurate steering feel and motion
- ADAS integration; VIRES, dSPACE ASM, TASS Prescan

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AGENDA
Wednesday, September 6th 2017

12:00 **Registrations opens**

Guided tours to simulation facilities

	Tour A	Tour B	Tour C	Tour D
13:00	**FKFS**	Transfer	Transfer	Transfer
14:00	Transfer	**OPTIS**	**Daimler**	**FKFS**
15:00	**Daimler**	Transfer	Transfer	Transfer
16:00	Transfer	**FKFS**	**OPTIS**	**Daimler**
17:00	**OPTIS**	Transfer	Transfer	Transfer
18:00	Transfer	**Daimler**	**FKFS**	**OPTIS**
19:00		Transfer	Transfer	Transfer

19:00 End

Here are some information about the guided tours :

Daimler: The visit will include a slide presentation of the activities at the Daimler Simulation Center, a tour of the Control Station, the Daimler Dynamic Simulator and the Stereoscopic Fixed Base Simulator (as presented during the conference).

Optis: Optis will present real time sensor validation demonstration in physically correct simulation. The demonstration will be carried out with Optis Driving Simulator using Optis VRX software interfaced with SCANeRStudio.

FKFS: The visit at FKFS will give an insight into current work on automated driving and related studies using the driving simulator. The tour concludes with a demonstration of the Stuttgart Driving Simulator, the largest high performance vehicle simulator at a research institution in Europe.

AGENDA
Thursday, September 7th 2017

8:00 Registration

8:55 **Welcome Note**

9:00 **Introduction**
Andras Kemeny | Chairman DSC, Renault, Arts et Métiers ParisTech, FranceHans-Christian Reuss | Stuttgart University
Gerd Baumman | FKFS

9:15 **Autonomous vehicle keynote**
The role of simulation in development and testing of autonomous vehicules
Hans-Peter Schöner | Daimler

Talk Session A: ADAS, Autonomous & Connected Vehicles

9:45 **Evaluating Driver Model Identifiability and Descriptiveness for Shared-Control Applications**
Barendswaard Sarah; Pool Daan M; Abbink David A.

10:05 **Predictive shared steering control for driver override in automated driving: a simulator study**
Guo Chunshi; Sentouh Chouki; Haue Jean-Baptiste; Popieul Jean-Christophe

10:25 **A Testing Framework for Predictive Driving Features with an Electronic-Horizon**
Elgharbawy, Mohamed

10:45 **Artificial Potential Field Framework for Semi-Autonomous Car Conception**
Le Gouguec Armand; Kemeny Andras; Merienne Frédéric; Berthoz Alain

11:00 Coffee break

11:30 **Autonomous vehicle keynote**
Road vehicule automation: history, opportunities and challenges
Steve Shladover | ITS Berkeley

12:15 **Poster Session and Exhibition**

13:00 Lunch

Talk Session B: Simulator Design & applications

14:30 **Perception-Based Powertrain Design Using a Dynamic Driving Simulator**
Baumgartner Edwin; Ronellenfitsch Andreas; Reuss Hans-Christian Schramm, Dieter

14:50 **Defining the Kinematic Requirements for a Theoretical Driving Simulator**
Olivari Mario; Pretto Paolo; Venrooij Joost; Bülthoff Heinrich H.

15:10 **A newly developed 3 DOF driving simulator for longitudinal dynamics perception investigation**
Erler Philipp; Rinderknecht Stephan

15:30 Coffee break

Talk Session C: Simulator Design & applications

16:00 **Power, Energy, and Latency Test Drives with the Wheeled Mobile Driving Simulator Prototype MORPHEUS**
Wagner Paul; Zöller Chris; Albrecht Torben; Winner Hermann

16:20 **A generic Steering Wheel Torque Model using Neural Networks**
Hörmann Stefan; Comudala Simpson Eduard; Bahram Mohammad

16:40 **Supporting the Implementation of Driving Simulator Environments Through Established GIS Approaches by Extending the Geospatial Data Abstraction Library (GDAL) with OpenDRIVE**
Scholz Michael; Orozco Idrobo Ana María

16:55 **Exhibition**

20:00 Conference dinner

AGENDA
Friday, September 8th 2017

Talk Session A: Motion Cueing & Control

09:00 **The Apparent Vertical Filter Concept – Effects of driving on a slope**
Seehof Carsten; Fischer Martin; Seefried Andreas

09:20 **An MPC based Multi-Sensory Cueing Algorithm (MSCA) for a high performance driving simulator with active seat**
Bruschetta Mattia; Cunico Daniel; Chen Yutao; Beghi Alessandro; Minen Diego

09:40 **Fast MPC based motion cueing algorithm investigation**
Fang Zhou; Tsushima Masashi; Kitahara Eiichi; Machida Naoya; Wautier Didier; Kemeny Andras

10:00 **Objective Motion Cueing Test – Automotive**
Haycock Bruce; Advani Sunjoo

10:15 **Rapid Tuning of the Classical Motion Cueing Algorithm**
Romano Richard; Sadraei Ehsan; Markkula Gustav

10:30 Coffee break

Talk Session B: Virtual Reality for Driving Simulation

11:00 **Measuring presence in driving simulation**
Mestre Daniel; Deniaud Christophe; Vincent Honnet

11:20 **Enhancing a Driving Simulator with a 3D-Stereo Projection System**
Schmieder Hannsjoerg; Nagel Katja; Schoener Hans-Peter

11:40 **Comparing Tangible and Fully Virtual Haptic Systems for HMI Studies in Driving Situation**
Lassagne Antoine; Kemeny Andras; Posselt Javier; Merienne Frederic

Industrial Keynotes

12:00 **Autonomous vehicle deployment: new developments in simulation software and hardware**
David Charondiere | OKTAL

12:20 **Human factors design & validation in virtual reality for AD cockpits**
Nicolas Dalmasso | OPTIS

12:40 **The cognitive simulation of the car driver for Autonomous Driving systems development**
Jean-Charles Bornard | ESI Group

13:00 Lunch - Poster Session & Exhibition

Talk Session C: Perception & Human Factors

14:30 **Measuring and Modeling Driver Steering Behavior: From Compensatory Tracking to Curve Driving**
Van der El Kasper; Pool Daan Marinus; Mulder Max

14:50 **Time-varying perceived visual-motion mismatch due to lateral specific force scaling during passive curve driving simulation**
Van Leeuwen Tim Daniël; Cleij Diane; Pool Daan Marinus; Mulder Max; Bülthoff Heinrich H.

15:10 Coffee break

Talk Session D: Perception & Human Factors

15:40 **The impact of subjective simulator experiences on statistical power in the RObot based Driving and Operation Simulator (RODOS)**
Reinhard René Tapiwa; Kleer Michael; Dreßler Klaus

16:00 **The use of proprioceptive cues in order to enhance presence in a dynamic motorcycle riding simulator**
Will Sebastian; Hammer Thomas; Pleß Raphael; Guth Sebastian

16:20 **Identifying the key factors that influence the realism of braking in a dynamic driving simulator through different levels of deceleration**
Savona Florian; Diaz Emmanuelle; Stratulat Anca; Melania Vars; Philippe Honnet; Vincent Masfrand; Stéphane Bourdin

16:40 **Conclusion**

17:00 End

This program is subject to modification.

DASSAULT SYSTEMES

SIMULIA

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SIMPACK MULTIBODY SIMULATION

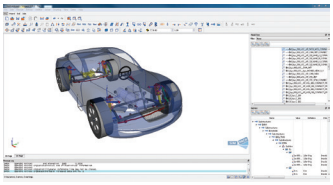
REALTIME DRIVING SIMULATOR

SIMPACK

As part of the SIMULIA brand, focused on realistic simulation, Simpack is now the strategic multibody simulation (MBS) component of the Dassault Systèmes 3DEXPERIENCE portfolio.

Simpack is the leading MBS software for mechanical and mechatronic designs and is internationally recognized for its excellence in the sectors of Virtual Prototyping and 3D-Simulation. Simpack is used for non-linear multibody simulation and is renowned for its ability to integrate flexible bodies.

Cars, trucks, engines, rail vehicles, wind turbines and airplanes are only a few of the industrial sectors Simpack is used in.

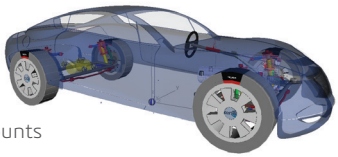


SIMPACK REALTIME

As a next step, by using Simpack Realtime, the virtual world (Simpack model) can be connected to the real world (hardware) to perform Hardware-in-the-Loop (HIL) simulations. These realtime simulations are used in various studies, from Handling/Ride Simulators to Advanced Drivers Assistance Systems.

HIGHLIGHTS

- Complete systems, including flexible bodies and detailed force elements, can be run directly in realtime
- Direct use of high-fidelity models: no model simplification needed
- Multi-core support; automatic parallelization
- Zero turnaround time
- Permits usage of non-linear frequency dependent bushings and mounts
- Multiple interfaces, e.g. dSPACE, Concurrent, Simulink®, rFPRO, Steering wheels, UDP.
- TMEasy, MF-Tyre, CDTire, FTire support



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POSTER PRESENTATIONS

- **Design and Implementation of the Delft Bicycle Simulator**
  George Dialynas, Oliver Lee, Arend Schwab
- **Research on Improving Steering Fidelity of Jilin University Driving Simulator**
  Xin Guan, Jun Zhan, Dejun Yang
- **Virtual road in an older town center**
  Erik Glädje Olsson, Laban Källgren
- **Improving Virtual Development and Validation of ADAS and Fully Automated Vehicles**
  Huber Bernd, Sippl Christoph, Djantliev Anatoli, German Reinhard
- **A new characterization of drivers' behaviours in a multi-agent approach**
  Berenice Reffet, Andras Kemeny, Benjamin Vailleau, Hakim Mohellebi, Philippe Mathieu, Antoine Nongaillard
- **Synthesized roads | high fidelity virtual roads from real world data sets**
  Mattias Hjort, Laban Källgren
- **The process and challenges of introducing a VR Simulator Capability to the Automotive Industry: A Scania Use Case**
  Stas Krupenia, Daniel Johansson, Jonathan Bengtson, Jon Friström, Linus Lindwall, Rickard Leandertz, Anna Selmarker
- **Development of a force feedback steering wheel control system to be used in VR-based racing simulators**
  Numan sözen, Ömer Özdemir
- **Collaborative Virtual Reality: An exploration in VR use for product evaluation**
  Jonathan Bengtson, Sebasthian Borsos, Stas Krupenia
- **Traffic Light Control Simulation for Various Simulation Environments**
  Behnecke D, Fischer M, Farkas B, Assmann D, Berekovic M, Köster F

- **Stochastic Traffic Simulation Based on Driver Behavior Modelling**
  Christopher Kober, Hans-Christian Reuss
- **MORPHEUS – Mobile Omnidirectional Platform for Highly Dynamic and Tirebound Driving Simulation**
  Paul Wagner, Chris Zöller
- **A Spatial Augmented Reality Driving Simulator for Prototyping 3D in-car User Interfaces**
  Florian Weidner, Wolfgang Broll
- **Comparison of MCAs Based on Optimal Filters and on MPC: Influence of the Time Horizon**
  Felix Ellensohn1, Joost Venrooij, Markus Schwienbacher, Daniel Rixen
- **Comparison of different Motion Cueing Algorithms in a wheeled mobile driving simulator**
  Z. Gong and U. Konigorski
- **Design and implementation of a realistic car sound simulation**
  Martin Keher, Anton Janeba, Dr.Gerd Baumann, Prof. Dr. Hans-Christian Reuss
- **Reconstruction of the visual system for a truck simulator**
  Andreas Jansson, Jonas Jansson
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  Andreas Jansson, Jonas Jansson
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  Andreas Jansson, Jonas Jansson

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OPTIS, the virtual prototyping company, brings life and emotion to all industrial projects. Its world-leading solutions pave the way for a revolutionary design process: towards zero physical prototypes. Since 1989, OPTIS offers its expertise in light and human vision simulation couples with leading CAD/CAM software and dedicated virtual immersive solutions. This synergy creates true-to-life virtual mock-ups used as real decision-making tools. Today, more than 2500 clients in over 50 countries already trust OPTIS and innovate day after day with our solutions to ensure the look and safety of their designs, reduce their ecological footprint and bring their future products to the market faster.

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OKTAL is worldwide supplier of high class driving simulators and a leading software editor. The SCANeR™ software suite is the most advanced simulation engine for driver assistance systems and autonomous driving simulators. Its accurate vehicle, sensors, driver and environment models, as well as its versatile architecture make it the perfect tool for intelligent system development and validation all along the V cycle.

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EXHIBITORS LIST

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D-Box Technologies brings a key element to driving simulation that is known as a '*Feel by the butt experience*'. «Using state of the art motion and vibration technologies, we offer seamless integration for any vehicle simulators. »
The majority of vehicle and laboratory manufacturers can take advantage of our optimal motion systems to re-enact highly believable and precise cues. These will create valuable anchor reflexes and create exclusive driving and simulation experiences. Our unique motion technology is currently being used for training by companies in a wide range of industries including Porsche, Sifat, Oktal John Deere, Corys, CM Labs, Tenstar, Thales, & Rheinmetall.
Best of all, D-BOX motion systems are equally compatible with industry simulation software (CarSIM and TruckSIM from Mechanical Simulation Corporation, Vortex from CM Labs Simulations, and SCANeR for Oktal, amongst others) so you can develop fully immersive simulated experiences for training and analysis.
With leading edge technology, years of experience and a team of passionate professionals, we can help you implement the most efficient simulation environment for your needs.

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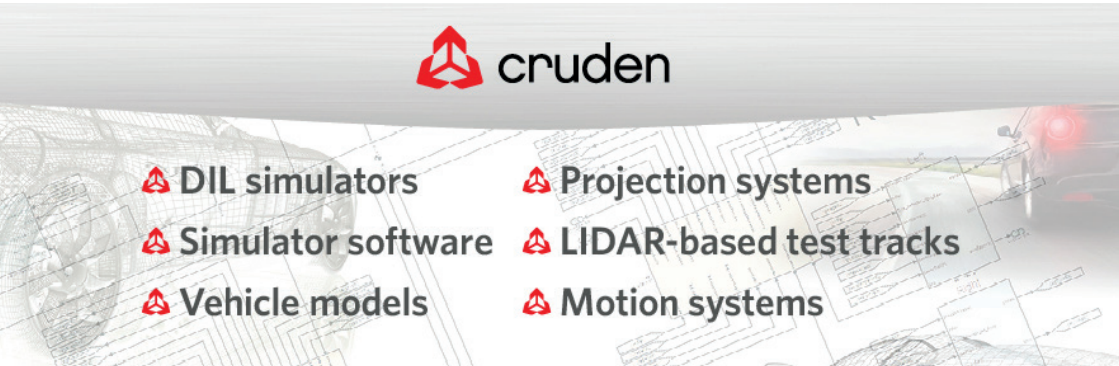

3D Mapping Solutions GmbH is the leading expert for high-precision kinematic surveying. 3D Mapping provides worldwide surveying services, e.g. in Europe, USA, China and Japan. We apply unique survey systems specially developed for automobile applications using high-resolution scanners and multiple calibrated cameras. The systems are able to digitize test or race tracks, PG's or public road networks with relative accuracy below 1 mm on the road surface. We provide high resolution road surface models (CRG, RGR and other formats) as well as high resolution maps with unparalleled level of detail as basis for autonomous driving and simulator applications.

www.3d-mapping.de | Booth # 01

SONY

Sony Corporation (Sony), incorporated on May 7, 1946, is engaged in the development, design, manufacture and sale of various kinds of electronic equipment, instruments and devices for consumer, professional and industrial markets, as well as game consoles and software.

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VISCHERS / communication partners

For the past four years, VISCHERS / communication partners and its Live Performance Division has been managing and developing racing simulators for Porsche AG's Branded Entertainment department.
In addition to the use as an eyecatcher and activation impulse in the Porsche Museum, in Porsche centres, at Porsche events and races worldwide, the second generation of Porsche Racing simulators (PRS 2.0) in the meantime is successfully used as a modular platform for R&D and Engineering at Porsche in Weissach as well.

www.vischers.com | Booth # 06

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smart eye

Smart Eye was founded in 1999 to provide the market with a real-time and completely non-invasive eye, eyelid and head tracking technology for a wide range of situations – with this a new generation of Eye Tracking technology based on 3D measurements was born. With its roots in the Automotive Industry, Smart Eye is today regarded as a global leader in the development and delivery of remote, multi-camera head and eye tracking solutions for the Automotive, Aviation and Aerospace research and manufacturing industries.

Our philosophy and focus is innovation in non-obtrusive, combined head and eye tracking solutions. We are proud of our position in the market as the gold standard for remote eye tracking, enabling complete freedom of movement within any given application environment while retaining impressive levels of gaze accuracy, field of view and robustness (0.5 degrees standard)

Today we have over several hundred clients and numerous systems deployed across North America, Europe and the Asia Pacific Region. Our systems are being used to support research projects and studies in areas including (but not limited to) HCI, Human Factors, Neuroscience, Psychology, clinical and more.

www.smarteye.se | Booth # 09

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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 colour 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.

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CONCURRENT

Concurrent's SIMulation Workbench® (SimWB) is a complete modeling environment for developing and executing real-time hardware-in-the-loop and man-in-the-loop simulations. Fully integrated SimWB solutions improve test quality and reduce development and production costs. Concurrent iHawk multiprocessing systems running SimWB are based on COTS components offering the latest, leading-edge processor, chipset, memory and I/O bus technology. With SimWB, individual I/O processes can be targeted to different system cores and I/O buses for parallel execution, thus allowing the simulation loop to run at faster frame rates. SimWB recognizes and utilizes multiple cores by default and there is no limit on the number of cores than can be used by SimWB.

www.ccur.com | Booth # 12

asc(s
Automotive Simulation Center Stuttgart

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 asc(s promotes, supports and realises the method development in the field of automotive simulation. Being an interest group and multiplier the association can offer its members a wide range of services and activities.
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.

www.asc-s.com | Booth # 14

Dassault Systemes – SIMULIA Simpack

Dassault Systèmes, "The 3DEXPERIENCE® Company", provides business and people with virtual universes to imagine sustainable innovations. The 3DEXPERIENCE platform and its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities in the virtual world to improve the real world.

As part of the SIMULIA brand, focused on realistic simulation, Simpack is now the strategic multibody simulation (MBS) component of the Dassault Systèmes 3DEXPERIENCE portfolio.

Simpack is the world leading MBS software for mechanical and mechatronic designs and is internationally recognized for its excellence in the sectors of Virtual Prototyping and 3D-Simulation. Simpack is used primarily within the automotive, engine, railway and wind energy industrial sectors, for simulating the motion of any mechanical system. Particularly well-suited for high frequency transient analyses, even into the acoustic range, Simpack was primarily developed to handle complex non-linear systems with flexible bodies and harsh shock contact.

With Simpack Realtime a major breakthrough in the field of realtime simulations has been achieved.

Unlike previous realtime solutions, Simpack Realtime works directly with fully parameterized Simpack models without the need for model reduction or a lookup table generation process.

Simpack Realtime supports a wide variety of targets, including dSPACE, Concurrent and Simulink®.

For more information please visit 3DS.com/SIMULIA or Simpack.com

www.3ds.com | Booth # 16

TEA ERGONEERS
FROM SCIENCE TO INNOVATION

TEA develops and supplies unobtrusive, state-of-the-art measurement and analysis solutions for simulation and HMI: remote and head-mounted eye-trackers, wireless physiological and Motion (IMU) sensors, and powerful software tools.

www.teaergo.com | Booth # 17

Noldus
Information Technology

With labs at companies and universities worldwide, researchers use Noldus tools to integrate different data streams. They investigate driving behavior, system performance, and more, in real-life situations and in a controlled laboratory environment. With over 25 years of experience, Noldus provides both the tools and the trained consultants to answer your business needs.

www.noldus.com | Booth # 20

FKFS

The Research Institute of Automotive Engineering and Vehicle Engines Stuttgart (FKFS) is a public-law foundation and was founded in 1930.
It is one of the best-known German research institutes and partner of the international automotive and supplier industry.

Highly qualified and motivated staff provide research and development projects in the fields of propulsion, automotive engineering and automotive mechatronics. Numerous highly specialized test benches and facilities and self-developed measurement, testing and simulation procedures are used to solve complex and challenging research tasks. Longtime experience in the development and application of development tools are an additional component of our services. Total confidentiality while working on projects is, of course, guaranteed.

www.fkfs.de | Booth # 21

Driving Simulation Association

driving-simulation.com

Founded in 2015, the Driving Simulation Association is dedicated to the community of driving simulation developpers and users.

The Driving Simulation Association aims to:

- Promote and encourage driving simulation in all its aspects: teaching, research, studies, developments, applications and products;
- Facilitate communication between people already involved or interested in driving simulation;
- Contribute to the organization of scientific conferences in the area of driving simulation, i.e. Driving Simulation Conference (DSC) Europe.

www.driving-simulation.com | Booth # 22

VIRES Simulationstechnologie GmbH

VIRES Simulations technologie GmbH, a German company founded in 1996, provides solutions for automotive, railroad and flight simulation. Our core product, the highly modular "VIRES Virtual Test Drive", is used for the development and testing of advanced driver assistance and active safety systems, leading to solutions for automated driving. 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. Installations cover SiL, DiL, ViL and HiL applications which may also be operated as co-simulations including 3rd party or custom packages. Adapting to our customers 'requirements is a core strength of our company. VIRES is key partner in the standardization projects "OpenDRIVE", "OpenCRG" and "OpenSCENARIO".

www.vires.com | Booth # 23

AB Dynamics supply test equipment to vehicle manufacturers and tier 1 suppliers. In 2016 the aVDS advanced Vehicle Driving Simulator was launched. This simulator, which utilises the Williams Advanced Engineering motion platform and rFpro digital content, has both exceptional excursion capability and consistent dynamic performance across the full range of motion. To arrange to test drive the aVDS simulator email simulatorenquiries@abd.uk.com

www.abd.uk.com | Booth # 24

MTS is pioneering the application of advanced simulation technologies and methods throughout all stages of vehicle development to realize new efficiencies, reduce costs and decrease time to market. Integrating these methods and technologies strategically throughout vehicle development enables more 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 at DSC Europe 2017 (Stand 25) and explore how advanced MTS simulation solutions can transform the efficiency and speed of your vehicle development program.

www.mts.com | Booth # 25

The Future is Now.
Is the SENSO-TM really a time machine?
Find out more about our new simulator cockpit at our booth or online.
www.sensodrive.de/SENSO-TM

www.sensodrive.de | Booth # 26

VI-grade is the leading provider of best-in-class software products and services for advanced applications in the field of system level simulation. Together with Saginomiya, leading provider of automatic controls and test systems, and a network of selected partners, VI-grade also provides revolutionary turn-key solutions for static and dynamic driving simulation. Established in 2005, VI-grade delivers innovative solutions to streamline the development process from concept to sign-off in the transportation industry, mainly automotive, aerospace, motorcycle, motorsports and railways. With office locations in Germany, Italy, UK, Switzerland, Japan, China, and the USA, and a worldwide channel network of 20 trusted partners, VI-grade is a dynamic and growing company with a highly skilled technical team.

www.vi-grade.com | www.driverinmotion.com | Booth # 27

TRIANGRAPHICS
Intelligent Terrain Solutions

TrianGraphics is operating on the Vis/Sim market and is specialized on the generation of databases for all types of real-time simulations. Besides the service of terrain generation, TrianGraphics is developing the terrain modelling solution Trian3DBuilder, which has unique features for road generation. Navigation data is analysed and parametrized to generate complex road networks. The software supports databases of arbitrary size, fully featured and ready to be used in driving simulations.

www.triangraphics.de | Booth # 32

TECHNISCHE UNIVERSITÄT DARMSTADT

The research focus at the institute of Automotive Engineering at Technical University Darmstadt is on driver assistance systems, vehicle dynamics, safety, brake systems, motorcycles and test methods. Relating to the last aspect, a wheel-based driving simulator concept is investigated since 2010.

Driving simulators (DS) are an indispensable developmental tool in the automotive industry. Versatile areas of application all profit from the high degree of reproducibility and safety of DS. The focus shift onto urban traffic simulation requires DS with increased system dynamics. The Technical University Darmstadt showed that a motion space of 230x300 m^2 is required for the unscaled simulation of representative urban driving scenarios without frequency gaps. The identified demands of this example exceed the motion envelope of all known DS due to the consequences for moving mass and system dynamics.

Wheeled Mobile Driving Simulators (WMDS) are able to overcome the described problems by eliminating the linkage between the dynamics and the moving mass. The main idea is based on the assumption that a system, whose dynamics is limited by friction forces, must be capable of simulating the dynamics of vehicles that are also limited by tire friction forces.

The feasibility of a WMDS for motion simulation of urban traffic is analyzed currently. In order to resolve feasibility, relevant DS properties are identified that are critical for performing urban driving simulation. These properties are analyzed using simulation tools of the WMDS' driving dynamics that are validated by experimental test drives. For this purpose, the scaled WMDS prototype MORPHEUS has been built up, which provides the same dynamic properties as the unscaled WMDS.

www.tu-darmstadt.de | Booth # Tent

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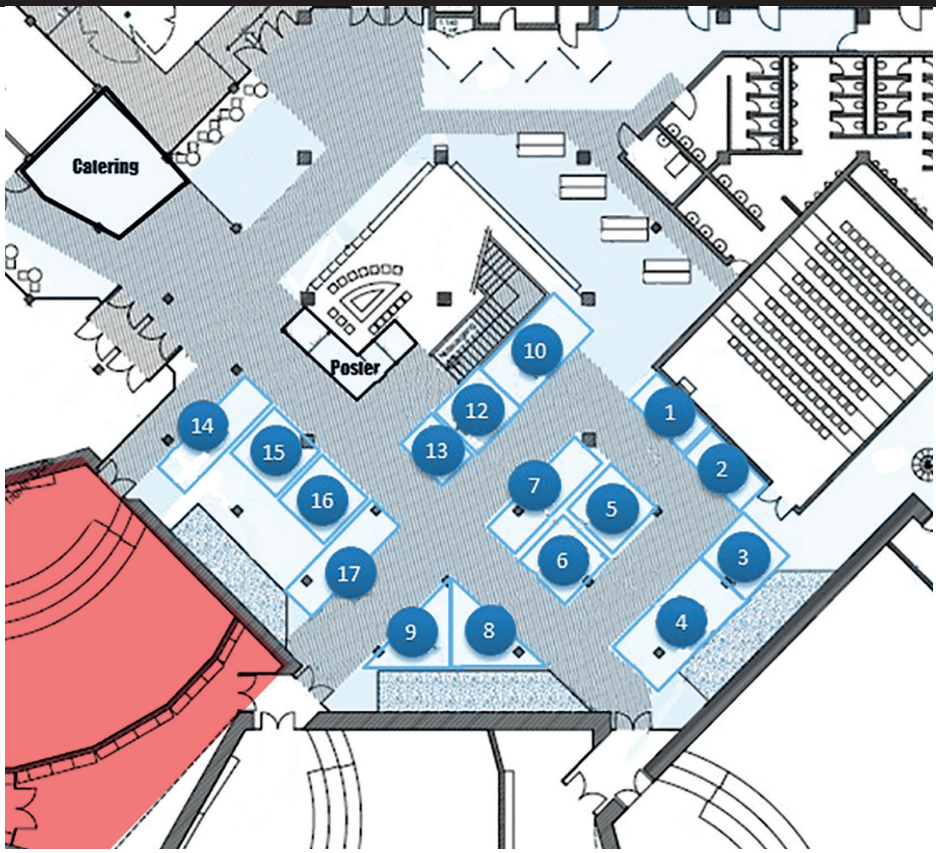
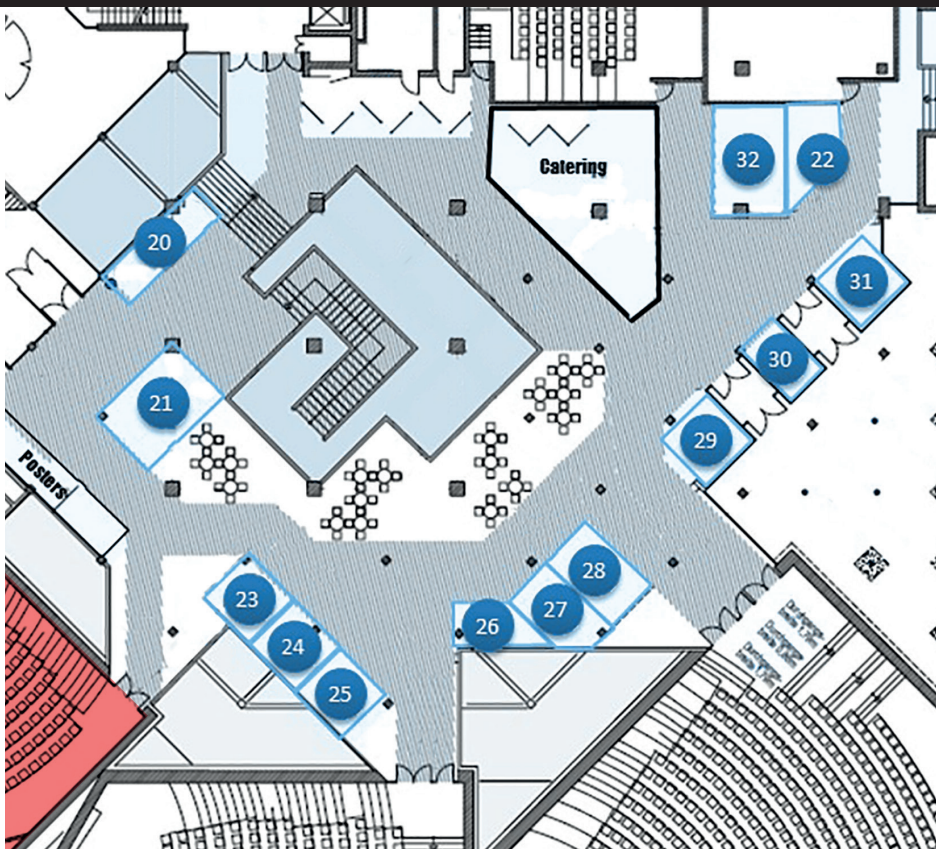


#01	3D Mapping	#10	Dome Projection
#02	Sony	#12	CCUR
#03	Biopac	#13	Thierry Clemot
#04	ESI GROUP	#14	ASC-S
#05	D-Box	#15	Ansible Motion Ltd
#06	Vishers	#16	Dassault
#08	Clarté	#17	TEA-ERGONEERS
#09	Smarteye		

The conferences will take place
in the amphitheater located to the left of the plan

EXHIBITORS UPPER FLOOR



#20	Noldus	#26	Sensodrive
#21	FKFS	#27	Vi-Grade
#22	DSA LIV	#28	Oktal
#23	Vires	#29	Optis
#24	Anthony Best Dynamics	#32	Triangraphic
#25	MTS	#Tent	TU Darmstad

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DO NOT MISS OUT !
THURSDAY 7 SEPTEMBER 2017

COCKTAIL PARTY

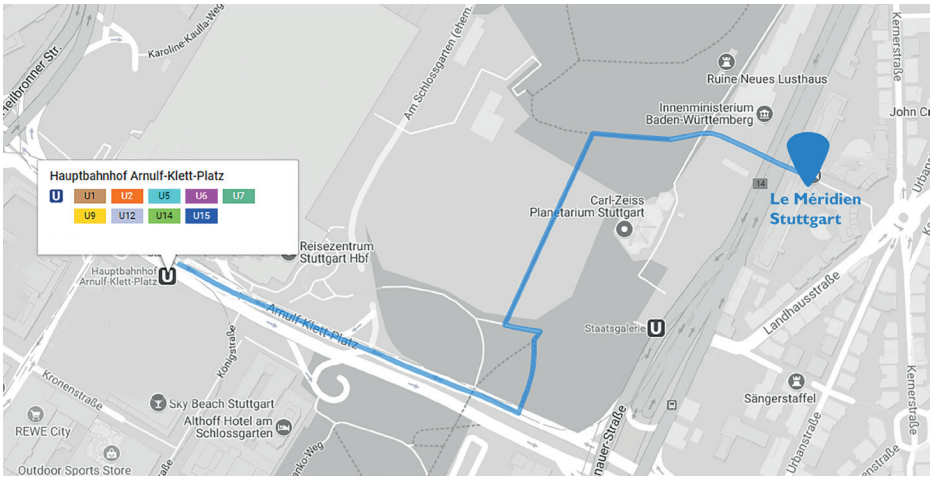
OPTIS as official platinium sponsor of DSC 2017
invites you to enjoy French cuisine at "Le Méridien Stuttgart"
for an evening party from 19h30 until 23h30

Le Méridien Stuttgart
Willy-Brandt-Strasse 30, Stuttgart, 70173

Get directions:
www.lemeridienstuttgart.com/en/location

Gmap link:
goo.gl/WuPU7N

800 m. About 10 min walk from
Stuttgart Hauptbahnhof



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