DSC

6-8 SEPTEMBER 2023

GUIDEBOOK

DSC 2023 EUROPE ^{VR}

Driving Simulation & Virtual Reality   Conference & Exhibition

Palais des Congrès, Antibes | France

Organized by

With the cooperation and support of

Arts Sciences et Technologies **et Métiers**

Renault Group

Université Gustave Eiffel

SIA SOCIÉTÉ DES INGÉNIEURS DE L'AUTOMOBILE

SMART VEHICLE CÔTE D'AZUR

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DSC 2023 EUROPE VR

Driving Simulation & Virtual Reality Conference & Exhibition

The Driving Simulation Conference gathers driving simulation specialists from the industrial and academic communities as well as commercial simulation providers. This 22snd edition follows that of 2022, held in Strasbourg, in a hybrid version with about **onsite 300 participants and more than 40 exhibitors.**

This year, DSC Europe 2023 VR is back with about 80 speakers in scientific and industrial product solution sessions, keynotes, tutorials, and round tables, you will get the latest trends in XIL and XR simulation for ADAS, automotive HMI and driving simulation design, motion sickness and rendering, as well as connected and autonomous vehicle verification and validation.

Themes include state of the art in driving simulation technology, research and developments, extended with progressively emerging virtual and augmented reality (XR) developments. This year's program will also host a special session on virtual validation and certification tools for autonomous and connected vehicles along with advanced driving assistance system (ADAS) applications. Human factors and motion rendering nevertheless will stay as a now traditional axes of the conference.

You are welcome to the DSC 2023 Europe Conference organized by the Driving Simulation Association, in cooperation with Arts et Métiers Institute of Technology and Gustave Eiffel University, with the support of Smart Vehicles Côte d'Azur and SIA, sponsored by ASAM, AV Simulation, Dassault Systèmes, Epic Games, MathWorks and SystemX, held on September 6-8 in Antibes for the conference and exhibition!

The way for tomorrow's vehicle

Table of content

We are 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 your technology and services. This year's conference 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 2023!

Palais des Congrès d'Antibes
30, chemin des Sables, 06160 Antibes – France

WiFi : DSCCONFERENCE
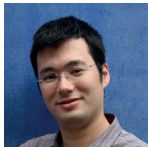Password : PDC092023

Organizing Committee

Andras Kemeny | *Conference chair*

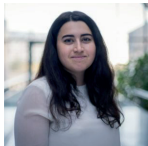President, Driving Simulation Association
Member of Board of Directors, ASAM

Florent Colombet | *Program Co-Chair*

Treasurer of Driving Simulation Association
Innovation Project Manager, Renault

Jean-Rémy Chardonnet | *Program Co-Chair*

Driving Simulation Association
Professor, Arts et Métiers

Tania-Marie Da Silva | *Conference Assistant*

Driving Simulation Association
Intern DSA

William Feith | *Conference Assistant*

Driving Simulation Association
Intern DSA

Ammar Ridzuan | *Conference Assistant*

Driving Simulation Association
PHD Student, Arts et Métiers Institute of Technology

Scientific Committee

The scientific committee is composed of recognized academics, OEM, Tier 1 or Standardisation body experts involved in driving simulation research activities in their organisations. Being member of the Scientific Committee involves also a commitment to avoid using his or her committee role in any individual consultancy activity, which may influence his or her objectivity in reviewing or any other undertaken committee task.

Chairman

Andras Kemeny	Driving Simulation Association (France)

Scientific Committee Members

Mohammad Bahram	BMW Group R&T (Germany)
Gerd Baumann	FKFS (Germany)
Klaus Bengler	Technical University Munich (Germany)
Jost Bernasch	The Virtual Vehicle (Austria)
Jelte Bos	TNO (The Netherlands)
Heinrich H. Bülthoff	Max Planck Institute (Germany)
Frank Cardullo	State University of NY (United States)
Viola Cavallo	University of Gustave Eiffel (France)
Jean-Rémy Chardonnet	Arts et Métiers Institut of Technology (France)
Florent Colombet	Renault (France)
George Drettakis	INRIA (France)
Magnus Eek	VTI (Sweden)
Stéphane Espié	University of Gustave Eiffel (France)
Zhou Fang	Renault (France)
Massimiliano Gobbi	Polytechnic University of Milan (Italy)
Peter Grant	University of Toronto (Canada)
Siddartha Khastgir	University of Warwick (UK)
Joseph K. Kearney	University of Iowa (United States)
Franck Mars	CNRS (France)
Philippe Mathieu	University of Lille (France)
Frédéric Mérienne	Arts et Métiers (France)
James Oliver	Iowa State University (United States)
Jean-Christophe Popieul	Hauts-de-France Polytechnic University (France)
Paolo Pretto	Virtual Vehicle (Austria)
Richard Romano	University of Leeds (United Kingdom)
Joost Venrooij	BMW Group (Germany)

Technical Committee

The Technical committee is composed of recognized industrial experts or managers of OEM, Tier 1 or research institutes involved in the driving simulation industrial ecosystem. Being member of the Technical Committee involves also a commitment to avoid using his or her committee role in any individual consultancy activity, which may influence his or her objectivity in reviewing or any other undertaken committee task.

Chairman

Luz Amanda Garcia Galeano	Marelli Europe S.p.A (Italy)

Technical Committee Members

Omar Amhad	NADS (United States)
Florent Colombet	Renault (France)
David Defianas	Stellantis (France)
Benjamin Engel	ASAM (Germany)
Vincent Honnet	SystemX (France)
Andras Kemeny	Arts et Métiers, DSA (France)
Stéphane Masfrand	Stellantis (France)
Martin Peller	BMW (Germany)
Stéphane Régnier	Renault (France)
Armin Stähle	Mercedes (Germany)
Georg Stettinger	Infineon (Germany)

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

Martin Fischer | *Team Leader "Human-Centred Simulation", German Aerospace Center (DLR)*

"Pegasus Project Family Perspective – Supporting the release of Automated Driving in Europeas"

Jürgen Niehaus | *CEO, SafeTRANS*

"ArchitectECA2030: Reference Homologation Process"

Peter Novaks | *Senior VP, aiData, aiMotive*

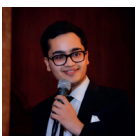"How 3D Data processing enables automated driving development"

Olivier Sappin | *CEO CATIA, Dassault Systemes*

"Deliver safe-by-design automated driving innovations with MBSE & massive simulation"

Thomas Nguyen That | *Chief Product & Strategy Officer, AVSimulation*

"From virtual to Reality: accelerationg engineering with simulation"

Div Tiwari | *Senior Product Manager, Mathworks*

"Elements of Practical Scenario Variation"

Danny Williams | *Technical Account Manager, Epic Games*

"From CAD to AI, Technological Synergies for Next-Gen Simulators"

Alaeddine Zouaoui | *Software Labs R&D Site Director & Engineering Director – Autonomous Drive & Platform Software Engineering, Renault*

"ADAS & AD Validation and Testing in the Heart of the new Renault Organization"

Wednesday, September 6th 2023

1 pm	REGISTRATION - *2nd floor*
	WELCOME DRINK - *Espace Méditerrannée - 3rd floor*
1:45 pm	CONFERENCE OPENING - *Antipolis Auditorium*

"Self-driving technology, driving simulation and XR"

Pr. Andras Kemeny | Conference Chair
*(President, Driving Simulation Association
Member of the Board of Directors, ASAM)*

2 pm	SPECIAL SESSION - *Antipolis Auditorium* ADAS / AD validation process targeting homologation *Chairman : Georg Stettinger*

2 pm

Plenary Talk
"Homologation - status quo and outlook"

R.DONA (EC/JRC)

2:25 pm

Insight Talks
"Current Industry and Research Activities
- Projects (Aithena, SUNRISE)
- Industry (OEM, Supplier, Tool Provider)"

R. FERREIRA (Continental); S. DE VRIES (IDIADA, Sunrise); H. GOTZIG (Valeo); A. SCHMIDT (EasyMile); A. FORRAI (Siemens)

3:10 pm	KEYNOTE - *Antipolis Auditorium*

"Pegasus Project Family Perspective"
Martin Fischer | *DLR*

3:30 pm	BREAK - *Espace Méditerrannée - 3rd floor*
4 pm	KEYNOTE - *Antipolis Auditorium*

"ArchitectECA2030:Reference Homologation Process"
J. Niehaus | *SafeTRANS*

| 4:20 pm | SPECIAL SESSION - *Antipolis Auditorium*
ADAS / AD validation process targeting homologation
Chairman : Georg Stettinger |

4:20 pm

Round Table

"How should collaborative European activities support homologation ? How can we avoid fragmentation of activities ? Relevance for CCAM ? How can we maximize the impact ?"

Speakers
Nicolas WAGENER (IKA)
Benjamin WILSCH (VDI/VDE-IT)
Siddartha KHASTGIR (WMG)

4:50 pm

Talks
"Roadmap to homologation
- Scenario Data Base
- Multi-Pillar Testing Approach
- Safety Argumentation – ODD Coverage
- Safety Assurance
- Type Approval"

S. KHASTGIR (Safety Pool, WMG); N. HARLAMMERT (dSPACE); P. WEISSENSTEINER (Virtual Vehicle); F. HERVELEU (UTAC); A. RICHTER (Volkswagen)

| 5:40 pm | END of the DAY |

7th

Program

Thursday, September 7th 2023

8 am	REGISTRATION - *2nd floor*
	WELCOME DRINK *- Gould Exhibition Space - 2nd floor*
9 am	KEYNOTE - *Antipolis Auditorium*

"How 3D data processing enables automated driving development"
Peter T. Kovacs | *Senior VP, aiData, aiMotive*

E X H I B I T I O N

9:30 am

SCIENTIFIC PAPER SESSION **Virtual Reality** *Antipolis Auditorium*	PRODUCT SOLUTION SESSION **ADAS / AD I** *Fitzgerald Room*

9:30 am

Haptic Wheelchair Locomotion Simulator: Design with Experimental Validation	Traffic simulation with human in the loop: roundabout scenario with reinforcement learning, edge computing and 5G connection
AIT-GHEZALA, AMEL (LAMIH UMR CNRS 8201 – UPHF); SENTOUH, Chouki; BENTALEB, Toufik; PUDLO, Philippe; POULAIN, Thierry; CONREUR, Gerald	*PREVIATI, Giorgio (DriSMi Driving Simulator); MASTINU, Giampero; CAMPI, Elena; GOBBI, Massimiliano*

9:55 am

Study of HMD tracking Systems Accuracy Applied to Short Head Displacements	A Virtual Testbed for Detecting Feature Interactions in ADAS/ AD Function Design
DROUET, Thomas (Renault); CHARDONNET, Jean-Rémy; POSSELT, Javier; REGNIER, Stephane	*BACHOREK, Adam (Fraunhofer IESE); MEILER, Martin*

10:20 am	Parameterization and Validation of a Steering Wheel Torque Model (short)	Introducing the COMPACT Full Spectrum Simulator (FSS): A Real-Time, Driver-in-the-Loop Simulator for Accurate and Cost-Effective Virtual Prototype Evaluations (short)
	RUSS, Fabian (Institute for Automotive Enginnering (ika) RWTH Aachen University); LEGRAN, Philipp; REIFFERS, Joe; WAGENER, Nicolas; ECKSTEIN, Lutz	*BOGEMA, Dave (VI-Grade), MINEN Diego*
10:35 am	Virtual Reality training for interacting with an automated bus docking at a bus stop (short)	Digital twin for synthetic data generation – application for automated driving systems
	WEIDEL, My (Swedish National Road and Transport Research Institute); SJÖRS DAHLMAN, ANNA; ANUND, Anna	*HOTAIT, Hassan (HAN University of Applied Sciences); FORRAI, Alexandru*

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11 am	BREAK - *Gould Exhibition Space - 2nd floor*

11:30 am	INDUSTRIAL KEYNOTE SESSION - *Antipolis Auditorium* *Chairman : Andras KEMENY*

11:30 am	"From Virtual to Reality: accelerating engineering with simulation"
	Latest trends in AD/ADAS simulation, the role of XIL, AI, XR as well as massive simulation and the solutions AVSimulation is proposing to support the mobility market in its digital transformation.
	Thomas Nguyen That | *Chief Product & Strategy Officer, AVSimulation*
11:50 am	"Elements of Practical Scenario Variation"
	Driving simulation is an essential tool for developing and testing autonomous vehicles, enabling researchers and engineers to evaluate vehicle performance and safety under a wide variety of scenarios. However, creating scenario variations that are diverse and representative of real-world situations remains a significant challenge.

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This keynote explores challenges and opportunities related to the creation and variation of scenarios. We will discuss how elements such as extensibility, interpretability, and interoperability are essential to maximize the value gained from generating driving scenarios.

Div Tiwari | *Senior Product Manager, MathWorks*

12:10 am | **"From CAD to AI, Technological Synergies for Next-Gen Simulators"**

Today's efficient simulation systems integrate technology solutions from diversified sources to deliver a range of benefits. Machine learning capabilities that have been traditionally used for training autonomous vehicles, for example, are playing an increasingly important role in the content definition of simulation exercises. During this presentation, Unreal Engine Simulation Industry Director Sebastien Loze will highlight use cases that are accelerating the evolution of next-gen sims along with insights into the most recent advancements of Unreal Engine features for simulation.

Danny Williams | *Technical Account Manager, Epic Games*

12:30 am | LUNCH *- Gould Exhibition Space - 2nd floor*

1:55 pm	SHORT NOTES **Scientific I** *Antipolis Auditorium*	SHORT NOTES **Product Solution** *Fitzgerald Room*
1:55 pm	High-fidelity Leaning-based Motion Cueing Algorithm by Bypassing Worst-Case Scenario *CHALAK QAZANI, Mohammadreza (Sohar University) et al.*	Artificial Intelligence solutions for Time Latency Cancellation for Driving Simulator and Remote Simulator Subsystems Connection *FAINELLO, Marco (Addfor) et al.*
2 pm	On the visual search of human, drivers: an eye-tracker based study at a driving simulator *CIOFFI, Anthony (Politecnico di Milano) et al.*	Using the Unreal game engine for Multi-User-Simulation – First impressions *GRÖNE, Kilian (Institut für Verkehrssystemtechnik) et al.*

E X H I B I T I O N

E X H I B I T I O N

2:05 pm	The effect of different infrastructures on driver response to a crossing pedestrian: a distributed simulation study	Physics-based sensor models validation
	YAND, Yue (University of Leeds) et al.	*FAUCHER, Florian (OKTAL-SE) et al.*
2:10 pm	Technical adjustments of a bycicle simulator – Impact on simulator sickness, presence and acceptance	Bay Zoltan's Driving simulation and Virtual Reality concept
	MARTINEZ GARCIA, Donaji (German Aerospace Center) et al.	*LELKES, Mark (Bay Zoltán) et al.*

SHORT NOTES
Scientific II
Fitzgerald Room

2:15 pm	A Virtual Reality Environement to Develop a Collision Warning System for Police Officers on the Roadway	Reproducing perturbation pulses using a driving simulator for standing bus passenger
	MOHAMMADI, Ahmad (York University); et al.	*SAPARIA, Smit (VIT) et al.*
2:20 pm	User-centered evaluation of a motorcycle riding simulator: 2D and VR	Intelligent VR in Driving Simulator
	PASNICU, Otilia (TU Darmstadt) et al.	*HADADI, Azadeh (Arts et Métiers Institute of Technology, LISPEN, HESAM Université, UBFC, Karlsruhe Instite of Technology) et al.*
2:25 pm	A Virtual Reality Wheelchair Simulator for Realistic Road User Behavior in Driving Simulations	
	PASNICU, Otilia (TU Darmstadt) et al	

EXHIBITION

EXHIBITION

2:30 pm

INDUSTRIAL PITCHES SESSION - *Antipolis Auditorium*
Chairman : Florent COLOMBET

"Dynisma : Drive ahead of the curve: Dynamic DIL simulators redefined"

Gavin Farmer | *Commercial Manager, Dynisma, United Kingdoms*

"SystemX : Boosting Digital Transformation"

Vincent Honnet | *R&D Manager – Thematic Referent "Connected Autonomous Transport", SystemX, France*

"Van Halteren Technologies : Finding the Sweet Spot for Advanced Driving Simulator Motion systems"

Rik de Swart | *Sales Manager Simulation Technology, Van Halteren Technologies, The Netherlands*

"Foretellix : Maximizing the Value of Simulation"

Dan Atzmon | *Head of Global Marketing, Foretellix, Israel*

"IPG Automotive : Virto, managing and optimising virtual test drives in the cloud"

Sylvain Chazot | *Managing Director, IPG Automotive, France*

"University of Leeds : Virtuocity a Centre for City Simulation"

Peter Woodthorpe | *Programme Manager – Virtuocity, Institute for Transport Studies, University of Leeds, United Kingdoms*

"Ansible Motion : Vehicle Development with Driver in the Loop"

Salman Safdar | *Business Development Director, Ansible Motion, United Kingdom*

"rFpro Transforming the realism and usability of driving simulation"

Josh Wreford | *PHead of Sales, rFPro, United Kingdom*

"Cruden: DIL system integration and how it can make or break the immersion in your simulator"

Dennis Marcus | *Commercial Manager, Cruden, Netherlands*

"ETSA : The European Voice of Modelling, Simulation & Training"

Quentin Blancheri | *Director, ETSA*

EXHIBITION

EXHIBITION

"VI-grade : Towards Zero Prototypes: Right Simulators and Right Models at the Right Time"

Michael Hoffmann | *Zero Prototypes Evangelist, VI-grade*

"AVES Reality : Towards the vision of simulating any place on earth – HD-maps and 3D worlds generated from on satellite imagery"

Florian Albert | *CEO & Co-Founder, AVES Reality*

3:30 pm	BREAK - *Gould Exhibition Space - 2nd floor*

3:45 pm	SCIENTIFIC PAPER SESSION **Perception and Human Factors** *Antipolis Auditorium*	PRODUCT SOLUTION SESSION **ADAS / AD II** *Fitzgerald Room*
3:45 pm	Effects of Visualization Quality on the Sense of Presence in a Pedestrian Simulator *REHM, Michaela Jacqueline (German Aerospace Center); UTESCH, Fabian; GRÖNE, Kilian; TEMME, Gerald; ZHAO, Min; FISCHER, Martin*	Tagging scenarios with custom metadata whilst retaining scenario exchangeability & Language Agnostic Automatic Scenario Tagging in ASAM OpenLABEL *ZHANG, X. (University of Warwick); BRUTO DA COSTA, A. A. (University of Warwick); FREEMAN, M.; KHASTGIR, S.; JENNINGS, P.; IRVINE, P. T.*
4:10 pm	Driver behavior on a motion-base simulator for vehicle dynamics maneuvers *TRUNZER, Stefanie (UAS Kempten); SCHULER, Kevin; SCHICK, Bernhard*	Holistic simulation and validation eco-system for testing of autonomous driving functions *PEPERHOWE, Michael (dSPACE); KRUMM, Holger*
4:35 pm	Driver steer feel metrics for ADAS case: A human-centric driving simulator study *RIOS LAZCANO, Andrea Michelle (Toyota Motor Europe); CARRERA AKUTAIN, Xabier*	ADAS Testing with RoadRunner Scenario *VALENTE, Michelle (MathWorks); FRANCOIS, Maxime; MILIA, Luigi*

EXHIBITION

EXHIBITION

5 pm

Human-vehicle steering interaction during a transient maneuver

GOBBI, Massimiliano (Politecnico di Milano); MASTINU, Giampero; MILIVINTI, Massimiliano; PREVIATI, Giorgio; RIOS HIDALGO, Daniel

ODD Standards for AD/ADAS virtual testing

MOHELLEBI, Hakim (Renault); ARNOUX, Emmanuel; VAILLANT, Eric; REGNIER, Stéphane; KEMENY, Andras

5:30 pm

INDUSTRIAL KEYNOTE - *Cassin Auditorium*

"Deliver safe-by-design automated driving innovations with MBSE & massive simulation"

6 pm

Olivier Sappin | *CEO, Catia, Dassault Systèmes*

7:30 pm

COCKTAIL DINNER PARTY

Let's meet at the Mediterranean space inside the Congress center to share our traditionnal cocktail dinner party!

Friday, September 8th 2023

8 am	REGISTRATION - *2nd floor*
	WELCOME DRINK - *Gould Exhibition Space - 2nd floor*

	SCIENTIFIC PAPER SESSION **Motion Sickness** *Antipolis Auditorium*	PRODUCT SOLUTION SESSION **Sim Design** *Fitzgerald Room*
9 am		
9 am	Modelling individual motion sickness accumulation in automated cars and driving simulators	Real-Time 3-D Tire Modeling with FTire: Enhancing Vehicle Performance Predictions on a Hexapod Office Simulator Using CarMaker
	KOTIAN, Varun (Delft University of Technology, Facuty of Mecahnical, Maritime and Materaisl Engineering, Cognitive Robotics); POOL, Dan Marinus; HAPPEE, Riender	*RIEFF, Benjamin (Cosin scientific software)*
9:25 am	Towards objective assesment of driving simulation sickness: Pros and cons of stomach electrical activity	Employing real-time multibody simulation in driving dynamics development
	MILJKOVIC, Nadica (University of Belgrade – School of Electrical Engineering); SODNIK, Jaka	*VENROOIJ, Joost (BMW AG); RATH, Lucas; SCHULTZE, Andreas; L'ERARIO, Maurizio*
9:50 am	Within- and Between-Subject Designs in Driving Simulator Validation: A Case Study	Configurable gear shifter for HGV using haptic rendering, force fields and FSM
	HIMMELS, Chantal (BMW Group); VENROOIJ, Joost; PARDUZI, Arben; Riener, Andreas	*SKERMO, Jo (SINTEF); OPLAND, Robert; MOEN, Terje*
10:15 am	SCIENTIFIC PAPER SESSION	PRODUCT SOLUTION SESSION

EXHIBITION

EXHIBITION

	SCIENTIFIC PAPER SESSION	PRODUCT SOLUTION SESSION	
10:15 am	**Motion I**	**Artificial Intelligence & Machine Learning**	E X H I B I T I O N
	Antipolis Auditorium	*Fitzgerald Room*	

10:15 am - Driving Simulator Experiment Stakeholder Perspectives on Motion Cueing Algorithm Quality (short)

KOLFF, Maurice (BMW AG); VENROOIJ, Joost; POOL, Dan Marinus; MULDER, Max

10:15 am - Digital Twin – Generation and Variation in Reinforcement Learning

KUSSMAUL, Stephane (TrianGraphics GmgH)

10:30 am - A Nonlinear Extension to Classical Filters for Washout Miscue Prevention (short)

BROWN, Craig Robert (BrownSim)

10:40 am - Data synthetization for verification and validation of Machine Learning based systems

10:45 am - Motion Cueing Algorithm for Effective Motion Perception: A frequency splitting MPC approach (short)

EBADI, Hamid (Infotiv); ROSELL, Joakim; BUI, Thanh; MARSIK, Lukáš; JENSEN, Jack; KARSBERG, Martin

JAIN, Vishrut (Technical University of Delft); LAZCANO, Andrea; HAPPEE, Riender; SHYROKAU, Barys

11 am	BREAK - *Gould Exhibition Space - 2nd floor*

	SCIENTIFIC PAPER SESSION	PRODUCT SOLUTION SESSION	
11:30 am	**Artificial Intelligence & Machine Learning**	**Motion II**	E X H I B I T I O N
	Antipolis Auditorium	*Fitzgerald Room*	

11:30 am

Construction of a Surrogate Model: Multivariate Time Series Prediction with a Hybrid Model

CARLIER, Clara (Statistic Department of Crest – Renault); FRANJU, Arnaud; LERASLE, Matthieu; OREBSKI, Mathias

AIC´s Virtual Development Center: Human-Machine Interface design in driver in-the-loop simulations

DE LA FUENTE, Victor (AIC – Automotive Intelligence Center);ROJO, Ander; NAVARRO, Guillermo; LANDUBURU, Mikel

SCIENTIFIC PAPER SESSION **Artificial Intelligence & Machine Learning** *suite* *Antipolis Auditorium*	PRODUCT SOLUTION SESSION **Motion II** *suite* *Fitzgerald Room*

11:55 am

Prediction of Vehicle Motion Signals for Motion Simulators Using a Multivariate CNN-LSTM Model	A Virtual Human Centred Design platform to support immersive experiences of future Automated Vehicles
ABDULRAQEB, Sheab Rawhan Adulsameea (Deakin University); ASADI, Houshyar; QAZANI, Mohamed Reza Chalak; MOHAMMED, Shady; NAHVANDI, Saied	*BORNARD, Jean-Charles (Université Gustave Eiffel, ESI Group); BELLET, Thierry; RICHARD, Bertrand; TOFFETTI, Antonella; BALOCCO, Elena; MATEO MARTINEZ, Begoña; PALOMARES, Nicolas; PERIAGO, Cristina; JACKSON, James*

12:30 am — LUNCH - *Gould Exhibition Space - 2nd floor*

2 pm

SCIENTIFIC PAPER SESSION **AD/ADAS** *Antipolis Auditorium*	SCIENTIFIC PAPER SESSION **Motion II** *Fitzgerald Room*
2 pm - Road users early lightweight driving simulator for ADAS development	**2 pm - Probabilistic Prediction of Longitudinal Driving Behaviour for Driving Simulator Pre-Positioning**
BARBIER, Alexandre (ESTACA'LAB); SAUDRAS, Sébastien; BARBEDETTE, Bertrand; LAROUCI, Cherif	*KOLFF, Maurice (BMW AG – Delft University of Technology); EPPINK, Maurice; VENROOIJ, Joost; POOL, Dan Marinus; MULDER, Max*
2:20 pm - Dynamic decision making for agent models in urban driving simulation	**2:25 pm - Study of motion cueing algorithm based on multi-shooting method for ROADS replaying scenario**
ROCK, Teresa (BMW Group – Technical university of Berlin); MARKER, Stephanie; BLEHER, Thomas; BAHRAM, Mohammad; DATTA SAVARAM, Narasimha; BERGER, Constantin; DRECHSLER, Maikol	*FANG, Zhou (Renault); THEILLIER, Dominique; COLOMBET, Florent; WAUTIER, Didier*

EXHIBITION

2:45 pm - Deep reinforcement learning based-motion cueing algorithm for universal trajectories (short)

SCHEIDEL, Hendrik (Institute for Intelligent Systems Research and Innovation, Deakin University); SEEFRIED, Andreas; CHALAK QAZANI, Mohammad Reza; BELLMANN, Tobias; HOUSHYAR, Asadi; NAHAVANDI, Saied

3 pm - Development and testing of an ACC system using a dynamic driving simulator with multi-drivers (short)

KOLFF, Maurice (BMW AG); VENROOIJ, Joost; POOL, Dan Marinus; MULDER, Max

2:50 pm - False cue reduction in motion cueing utilising the vehicle performance envelope

HVITFELDT, Henrik (Royal Institute of Technology – ECO2 Vehicle Design); JERRELIND, Jenny; DRUGGE, Lars

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3:15 pm

| WORKSHOP **ADScene** *Antipolis Auditorium* | PRODUCT SOLUTION SESSION **Driver-In-Loop Virtual Reality** *Fitzgerald Room* |

ADScene plateform is a SaaS scenario library that provides tools to ensure safety of ADAS and AD.

Relevant scenarios and associated design functionality included in ADScene are already used by OEM during design and validation process.

This « hands-on » workshop will provide an in-depth experience of ADScene framework, data and tools for mobility stakeholders.

GUYONVARCH, Laurette (Renault)

3:15 pm - Prototype the UX of Your Future Automotive Cockpit

SIGRIST, Pierre (EPICNPOC)

3:40 pm - Ika's highly Dynamic Driving Simulator (short)

WAGENER, Nicolas (RWTH Aachen University); RUSS, Fabian; BECKMANN, Jobst; LEGRAN, Philipp; ECKSTEIN, Lutz

EXHIBITION

EXHIBITION

REVERT, Erwan; HONNET, Vincent (SystemX)

AUTRIC, Pierre-Denis (CapGemini)

3:55 pm - A Comparison of HMD and CAVE-Driven Visualization for Hand Interaction in Driving Simulators

KROYS, Alexander (Volkswagen AG); TEKCAN, Cagdas; HARTFIEL, Bert; SCHIMMEL, Timo; ORTMEIER, Frank; STARK, Rainer

4:15 pm — KEYNOTE - *Antipolis Auditorium*

"ADAS & AD Validation and Testing in the Heart of the new Renault Organization"

Alaeddine Zouaoui | *Software Labs R&D Site Director & Engineering Director – Autonomous Drive & Platform Software Engineering, Renault*

4:45 pm — CLOSING - *Antipolis Auditorium*

DSC 2023 Europe VR Organization Committee

5 pm — *END of DSC 2023 Europe VR*

SCIENTIFIC POSTERS

High-fidelity Leaning-based Motion Cueing Algorithm by Bypassing Worst-Case Scenario

CHALAK QAZANI, Mohammadreza (Sohar University), ASADI, Houshyar; LIM, Chee Peng; NAHAVANDI, Saeid

On the visual search of human, drivers: an eye-tracker based study at a driving simulator

CIOFFI, Anthony (Politecnico di Milano); TESTORI, Alessandro; MELZI, Stefano

The effect of different infrastructures on driver response to a crossing pedestrian: a distributed simulation study

YAND, Yue (University of Leeds); LEE, Yee Mun; KALANTARI, Amir Hossein; GARCIA DE PEDRO, Jorge; HOROBBIN, Anthony; DALY, Michael; SOLERNOU, Albert; MARKKULA, Gustav; MERAT, Natasha

Technical adjustments of a bycicle simulator – Impact on simulator sickness, presence and acceptance

MARTINEZ GARCIA, Donaji (German Aerospace Center); GRÖNE, Kilian; JANSSEN, Véronique; JACOBI, Dennis; ACKERMANN, Stefanie; ZHAO, Min; NICOLAY, Eric; BERGEN, Melina; FISCHER, Martin

A Virtual Reality Environement to Develop a Collision Warning System for Police Officers on the Roadway

MOHAMMADI, Ahmad (York University); PARK, Peter Y.; ASGARY, Ali; MUKHERJEE, Abir; LIU, Xia

Reproducing perturbation pulses using a driving simulator for standing bus passenger safety

SAPARIA, Smit (VTI); JIA CHENG, Xu; MAYTHEEWAT, Aramrattana

Coupling full Human in The Loop experience with Hardware in The Loop Steering test bench architecture

ALFATTI, Federico (Meccanica); ANTICAGLIA, Alessio; VENEROSO, Luca; LELLI, Lorenzo; VITALITI, Daniele; ANNICCHIARICO, Claudio

User-centered evaluation of a motorcycle riding simulator: 2D and VR

PASNICU, Otilia (Politecnico di Milano); MENIG, Angela

Intelligent VR in Driving Simulator

HADADI, Azadeh (Arts et Metiers Institute of Technology, LISPEN, HESAM Université, UBFC – Karlsruhe Institute of Technology); CHARDONNET, Jean-Rémy; LANGOVOY, Mikhail; GUILLET, Christophe; OVTACHAROVA, Jivka

PRODUCT SOLUTION POSTERS

Using the Unreal game engine for Multi-User-Simulation – First impressions

GRÖNE, Kilian (Institut für Verkehrssystemtechnik); REHM, Michaela; MARTINEZ GARCIA, Donaji; TEMME, Gerald; QUANTE, Laura; ACHILLES, Marvin; FISCHER, Martin

Physics-based sensor models validation

FAUCHER, Florian (OKTAL-SE); LATGER, Jean

Artificial Intelligence solutions for Time Latency Cancellation for Driving Simulator and Remote Simulator Subsystems Connection

FAINELLO, Marco (Addfor); GIULIACCI, Tiziano Alberto; BALLESIO, Stefano; MINEN, Diego; DE VECCHI, Roberto; FORMAGGIA, Fabio; CARBONATI, Andrea; TRAININI, Daniele

Bay Zoltan's Driving simulation and Virtual Reality concept

LELKES, Marc (Bay Zoltán); SOOS' Robert; UNGAR, Peter; SZAVAI, Szabolcs; TUSKE, Tamas; NEMETH, Csaba

Floor Plan

Terrasse

Terrasse

Terrasse

C

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C

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C

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Organizers Office

Storage Room

Palais des Congrès Space
Access to :
- Organization Office
  - Storage Room
    - Toilets
- Technical Premises
  - Emergency Exit

6 m² **Booth 6 m² (2m x 3m)**

9 m² **Booth 9 m² (3m x 3m)**

12 m² **Booth 12 m² (3m x 4m)**

C **Catering table**

Attendee bar table

Pillar

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🟩	3D Mapping Solutions GmbH	#44			
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🟦	Applied Intuition	#30	🟦	MathWorks	#15
🟩	Arts et Métiers Institute of Technology	#41	🟦	NI	#26
🟩	ASAM e.V.	#43	🟦	OPAL-RT STI	#22
🟦	AVES Reality	#31	🟦	rFpro Ltd	#28
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🟦	ICT AG	#17	🟦	WMG, University of Warwick	#24
🟦	Infiled	#27			

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– Simulate driving scenarios
– Design planning and control algorithms
– Design perception algorithms
– Deploy algorithms using code generation
– Integrate and test.

www.mathworks.com

ASAM e.V. is a non-profit organization that promotes standardization in automotive development. Together with its more than 400 member companies, ASAM develops standards that enable easy exchange of data and tools within and across tool chains. ASAM standards span a wide range of use cases in automotive verification and validation (V&V) and are in use worldwide.

The ASAM OpenX® standards in particular aim to provide a complete set of standards for simulation-based testing of automated driving functions. They cover a wide range of use cases for virtual development, including hybrid testing approaches that combine virtual and physical components. ASAM OpenX standards are gradually becoming the industry's reference for their respective use cases and are supported by a majority of simulation tool providers and manufacturers worldwide.

www.asam.net

Dassault Systèmes is a sustainable innovation leader.
We provide business and people with 3DEXPERIENCE universes to imagine sustainable innovations capable of harmonizing product, nature and life. Our business is innovation. Thanks to the 3DEXPERIENCE platform, we provide software solutions that allow customers to create innovative new products and services using virtual experiences. Our aim is to build a new development model to address the major challenges facing the world today.

www.3ds.com

SystemX is a Research and Technology Organisation (RTO - Institut de Recherche Technologique - IRT), dedicated to the digital engineering of systems, and expert in the analysis, modelling, simulation and decision support for complex systems. SystemX coordinates partnership-based research projects, bringing together academics and industrials in a multidisciplinary and cross-cutting perspective. Together, they strive to lift key scientific and technological barriers to the benefit of 4 priority fields of application: Mobility and Autonomous Transport, Industry of the Future, Defence and Security, Environment and Sustainable Development. Within the framework of use-case oriented projects, SystemX researcher engineers answer the great challenges of our time, both for society and technology, thus contributing to accelerate the digital transformation of industries, services and territories.

www.irt-systemx.fr

Arts et Métiers Institute of Technology is a French « Grande Ecole d'Ingénieur » founded in 1780 specializing in mechanical, industrial and energy engineering. The Laboratory of Engineering in Cyberphysical Systems (LISPEN) has an education and research team specialized in XR for 25 years with extensive work on individualized interaction in immersive environments, cybersickness reduction and perception issues. The team has large immersive facilities including a 5-sided CAVE, head-mounted displays, multi-sensory interaction devices, physiological and behavioral measurement devices. LISPEN has also an activity in driving simulation, with facilities including dynamic and static simulators, coupled with immersive technologies, and addressing scientific issues related to HMI, simulator sickness, perception and motion cueing.

www.institutimage.ensam.eu

The Driving Simulation Association (DSA) aims to promote and encourage driving simulation and XR within all aspects: research, development, applications, and products, facilitating communication between individuals and academic as well as industrial organizations and contributing to the organization of scientific conferences. DSA is also proposing dedicated services in the use of driving simulation and XR.

driving-simulation.org

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

SVCA supported by Team Côte d'Azur, the Local Economic Development Agency, is promoting the Côte d'Azur region as an attractive land for smart vehicle players. At SVCA we act so that the connected and autonomous vehicle players are in favorable conditions to perform their R&D faster, cheaper and more effi ciently for an optimal societal adoption of the new Mobility use cases and to Create a market-oriented scientifi c ecosystem, one that is driven by industry players present today and new entrants attracted by this ecosystem.

www.investincotedazur.com

Université Gustave Eiffel

The Gustave EIFFEL University was born out of the merger of Université Paris-Est Marne-la-Vallée and IFSTTAR, the Institute for European Research on Cities and Regions, Transport and Civil Engineering. It includes a school of architecture, EAV&T, and three engineering schools, EIVP, ENSG Géomatique and ESIEE Paris. By creating for the first time in France a three-way partnership between a university, research organisations and schools of architecture and engineering , it will have the specific purpose of fostering national and international partnerships to meet the major societal challenges generated by the profound changes in urban areas, which are already home to 55% of mankind.

www.univ-gustave-eiffel.fr

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Booth n°44

BRINGING REALITY IN DIGITAL WORLDS
3D Mapping Solutions 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.
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.
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www.3d-mapping.de

Booth n°29

Ansible Motion creates and deploys a wide range of Driver-in-the-Loop (DIL) simulators around the world for all types of vehicles, driving scenarios, experiments and product development aims. From small desktop systems to full size dynamic simulators, Ansible Motion's products deliver class leading virtual test driving experiences. Featuring advanced computational and mechanical performance capabilities, they create compelling virtual worlds for drivers and product development engineers.

www.ansiblemotion.com

Applied Intuition

Applied Intuition is the foremost enabler of autonomous vehicle (AV) development. The company's suite of simulation, validation, and drive log management software makes it faster, safer, and easier to bring autonomy to market. AV programs across industries and 17 of the top 20 global OEMs rely on Applied's solutions to develop, test, and deploy autonomous systems at scale.

www.appliedintuition.com

Arts et Métiers — Sciences et Technologies

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www.asam.net

AVES REALITY

AVES Reality automates HD-map 3D virtual world creation, to empower simulation-based testing and synthetic training data generation in ADAS and AD. With our AI-enabled solution, based on satellite images and other real-world geodata, we follow the vision to deliver any place on earth as simulation-grade 3D environment including an own HD-roadmap.

www.avesreality.com

AVSIMULATION

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Our flagship software, SCANeR™, enables automotive manufacturers and researchers to develop, test, and validate mobility systems within highly realistic virtual environments. From ADAS to autonomous vehicles, SCANeR offers diverse scenarios for assessing safety, performance, and functionality. With a range of simulators and custom solutions available, AVSimulation accelerates the development and deployment of all mobility systems, driving towards safer and more efficient transportation solutions.

www.avsimulation.fr

cosin
scientific software

cosin scientific software AG offers simulation software for advanced tire and road surface modeling for vehicle dynamics simulation. The key product, FTire, is the leading high-frequency and multi-purpose tire model.

Development of the physical model started in the late 1980s and FTire subsequently established its position as the reliable and trusted tire simulation software for vehicle comfort, road loads and NVH analysis. Since 2009, FTire development, support, and engineering services are provided by cosin scientific software, headquartered in Munich, Germany.

Virtual testing is key and driving simulators and other hardware-in-the-loop systems are increasingly replacing real tests. The availability of FTire throughout the development cycle is unique and ensures consistency for all simulations.

Together with several partners worldwide, cosin scientific software offers the full range of support for tire data measurement, parameter identification, and road surface measurement

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Booth n°19

Cruden is the world's leading designer, manufacturer and integrator of professional open architecture driving simulators for the automotive, motorsport, marine and motorcycle industries. We supply flexible, durable, high performing real-time simulators and their modular components: hardware, software, vehicle models, content and visual systems. Our driver-in-the-loop (DIL) simulators and Panthera Software Suite are designed to slot into customers' existing tool chains so their engineers can be up and running quickly with a future-proof system that does not tie them to any one supplier. Having recognized the potential of engineering simulators to save time and money through DIL testing since the 1990s, we have installed over 100 driving simulators globally and gained a firm reputation as a trustworthy simulator expert. ADAS/AD testing A Cruden simulator easily slots into a typical automotive test environment – for the development and validation of ADAS/AD controllers by hardware-in-the-loop (HIL) integration, for example. Integration is made possible by Panthera's ePhyse tool, conversion tools and integration work undertaken by Cruden with the suppliers of third-party packages commonly used by automotive OEMs and Tier 1s. We eliminate the need for complicated configuration work by our customers. Our simulators are created by people who understand the importance of human factor research, for the development of autonomous cars that customers can trust. We've helped many automotive teams design driver-in-the-loop experiments to validate human-machine handover control scenarios. Our technologies prioritise driver and passenger immersion, ensuring relevant and valuable feedback on autonomous controllers.

dSPACE

dSPACE is a leading provider of simulation and validation solutions worldwide for developing connected, autonomous, and electrically powered vehicles.

The company's range of end-to-end solutions is used particularly by automotive manufacturers and their suppliers to test the software and hardware components in their new vehicles, long before a new model is allowed on the road.

Our portfolio ranges from end-to-end solutions for simulation and validation to engineering and consulting services as well as training and support.

With more than 2,400 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, Croatia, South Korea, and India. 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

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Dynisma deliver the most dynamic, realistic and scalable driving simulators in the world.

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Foretellix is the leading provider of safety-driven verification and validation solutions for Automated Driving Systems and ADAS. Foretellix's Foretify™ platform helps automotive, trucking, and mining customers to ensure safety, reduce development costs, and accelerate time-to-market. Foretellix is headquartered in Israel, with offices in the US, Europe, and Asia. For more information, visit http://www.foretellix.com.

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www.ict.de

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INFiLED is headquartered in Shenzhen and registered under the full name Shenzhen Infiled Electronics Co., Ltd. It is a high-tech enterprise specialized in developing and manufacturing large LED video equipment.

Focused on constant innovation and continuous improvement, INFiLED now owns over 100 patents, which is one of the highest numbers in the industry.

INFiLED's product range covers a wide range of applications, as there are advertisement, transportation, sports, events, command & control, corporate branding and meetings, creative applications and so much more. Our products have been installed in over 76 countries and our products have been CCC, CE, UL, ETL, FCC, RoHS and TUV certified.

Using the most advanced production equipment and the most reliable components, INFiLED delivers the highest quality and most reliable equipment available. INFiLED strictly carries out the ISO9001 Quality Management System, Total Quality Management System, ISO14001 Environment Management system and OHSAS18001 Occupational Health and Safety Management System. INFiLED has grown fast over the past couple of years and our service is now extending worldwide. We have opened a Global Repair Center in Hong Kong and we have sales, service and representative offices in United States, the Netherlands, United Kingdom, Middle East, Australia, South Africa and South America, offering customers the best service and user experience.

Based on the principle of 'Dedicate work, Enjoy life', INFiLED is striving to be a top brand of LED screen manufacturer to enlighten the world with a visual feast!

www.infiled.com

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ARCHITECTURE & INTÉGRATION AUDIOVISUELLE

GP SCREEN is a French company specializing in the integration, design and installation of customized professional audiovisual solutions. Since 2004, the company has been analyzing, designing and installing audiovisual solutions and tools for immersive use, as well as installing and deploying curved screens dedicated to simulators.

www.gp-screen.com

IPG
AUTOMOTIVE

We publish the CarMaker software package for cars, TruckMaker for trucks and MotorcycleMaker for two-wheelers. These simulation platforms are designed to be modular and open, enabling them to be used in Model-In-the-Loop, Software-In-the-Loop, Hardware-In-the-Loop, and Vehicle-In-the-Loop, or even in co-simulation with third-party software. We also adapt our solutions to our customers' ecosystems. We have designed a software architecture that offers a complete library of physical models, for sub-system simulation of the complete vehicle, with its driver and driving environment. This remains open to the integration of third-party models. More than 160 of our customers are positioned across the entire automotive industry. We provide local support through 14 local offices in Asia, the United States and Europe, including our subsidiary in the Paris region of France.

www.ipg-automotive.com

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– Access, visualize, and label data
– Simulate driving scenarios
– Design planning and control algorithms
– Design perception algorithms
– Deploy algorithms using code generation
– Integrate and test

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Booth n°26

At NI, we Engineer Ambitiously. We celebrate creative problem solving. And we take our customer relationships to heart. We believe in the power and potential of making connections—between people, ideas, and technology. In fact, connection is central to everything we do. We constantly challenge ourselves to find those connections because that's what creates a path forward for you to engineer the extraordinary today, tomorrow, and for the next 100 years.

This means bringing the right people together to build solutions that make a difference. It means combining fresh perspectives with new technologies to turn your vision into reality.

Always aspiring beyond this moment, we're curious and willing to take chances because we know that everything we learn today will guide us into our future. We also know that things don't always go exactly as planned. Some may call that failure, but we see it as a lesson that helps us become stronger, faster, and better. We celebrate those who are comfortable failing because the only way to know if something works is to uncover the ways it doesn't.

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DRIVING SIMULATION

rFpro is a simulation environment for the automotive and motorsport industries. It is used for the development and testing of autonomous vehicles, ADAS, vehicle dynamics and human factor studies – essentially anything that involves driving a vehicle. rFpro's automotive customers are the world's largest car manufacturers, tier one suppliers and sensor developers. We enable them to simulate, test and validate new sensors, control systems and vehicle hardware systems. The top 10 OEMs that were early adopters of rFpro technology have already launched road cars which started their development, not on a test track, but in a virtual environment using rFpro.

www.rfpro.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. OPAL-RT Intelligent Transport System, the new division of OPAL-RT dedicated to simulation and testing of intelligent transportation systems, will be happy to present at the DSC Expo its new AD Solutions.

www.opal-rt.com

Sensodrive Simulators. Perfect Simulations – Perfect Results. 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 first company to launch specialized torque sensors for robotic 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 highend 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°46

Smart Eye is the global leader in Human Insight AI, technology that understands, supports and predicts human behavior in complex environments. Bridging the gap between humans and machines for a safe and sustainable future. Smart Eye was founded in 1999, is publicly traded and headquartered in Sweden with offices in the US, UK, Germany, Denmark, Egypt, Japan, Singapore and China.
Through our Research Instruments, Smart Eye offers the world's most advanced eye tracking systems for analyzing human behavior. Offering unparalleled performance in complex environments, our carefully crafted instruments enable unparalleled insights into human behavior and human-machine interaction in automotive, aviation, assistive technology, media & marketing, behavioral science and many more fields.

www.smarteye.se

Booth n°39

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Booth n°48

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Booth n°45

Thierry CLEMOT's company creates 3D environments for cars simulators. Real environments are created from high accuracy 3D Laser Scan. Available quickly, our 100 km urban model "CITY" allows us to create every exercices needed in fictive environments.
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Don't hesitate to consult the database catalog on thierryclemot.com

With our powerful proprietary software tools and our long experience in 3D terrain development, we are pushing the boundaries of the simulation and automotive market when it comes to detail, quality, size, efficiency and realism of digital environments.
Use our flagship product Trian3DBuilder to create photo-realistic 3D terrains by automatically processing real-world data or using procedural approaches.

www.triangraphics.com

Safety Pool™ Scenario Database is the world's largest public database of scenarios for Automated Driving System testing, validation, and certification. It was founded by Deepen AI and WMG, University of Warwick, UK. This database is a global initiative for certifiable AV Safety that is informed by industry needs, embraced by regulators, and recognised by governments worldwide.
The Verification and Validation (V&V) team's research at WMG focuses on the entire V&V pipeline for Automated Driving including test scenarios, simulation-based testing, safety argumentation and is influencing international standards and policies to enable a safe introduction of Automated Vehicles. As a leading academic research team, we collaborate with international and local policymakers, regulators, and industrial partners on various research projects and policy implementations across the verification and validation spectrum.

www.safetypool.ai

As UTAC, we are a market-leading group in vehicle testing, type approval and emerging technologies for autonomous, connected and electric vehicles. We provide services and systems to customers in the automotive, transport, tyre, petrochemical and defence industries. We deliver regulation and homologation support, specialist vehicle conversions and test systems as well as training, consulting, audit and certification, technical inspection, standardisation and events.

Formed in 2021 after UTAC CERAM and Millbrook merged their operations, we now operate 8 test centres across France, the UK, the USA and Northern Finland, with a 9th due to open in Morocco in late 2021. We have subsidiaries in Russia, China, Japan and Germany and employ 1280 people globally.

www.utac.com

![VI-GRADE logo]

VI-grade is the global provider of disruptive vehicle development solutions that are paving the way to developing vehicles with Zero Prototypes. Its human-centric solutions comprise industry-leading real-time simulation software, professional driving simulators and Hardware-in-the-Loop solutions that accelerate product development across the transportation industry.

The company's suite of scalable driving simulators covers a wide performance range to assess the multi-disciplinary driving experience. These proven solutions enable OEMs, suppliers, research centers, motorsport teams and universities to reduce physical prototypes while accelerating innovation in their quest to get ever nearer to achieving the ultimate development goal of Zero Prototypes.

VI-grade is part of HBK's Virtual Test Division, which focuses on providing real-time software, simulator, and hardware-in-the-loop solutions to virtually test products throughout the development cycle, helping companies accelerate innovation and reduce time-to-market, and improve their competitive advantage.

Since September 2018, VI-grade has been part of Spectris plc. 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

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

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