

# 16 – 18 SEPTEMBER PROGRAMME

Max Planck Institute for Biological Cybernetics, Tübingen

## DSC 2015 EUROPE

Driving Simulation Conference & Exhibition



Max-Planck-Institut  
für biologische Kybernetik



# WEDNESDAY, 16 SEPTEMBER 2015

**12:00 REGISTRATION OPEN**

## TUTORIALS – MEASURING HUMAN IN SIMULATION

**13:00 Tutorial 1 – Measuring, Identifying and Modeling Driver Behaviour**

**David Abbink** | Delft University of Technology, The Netherlands

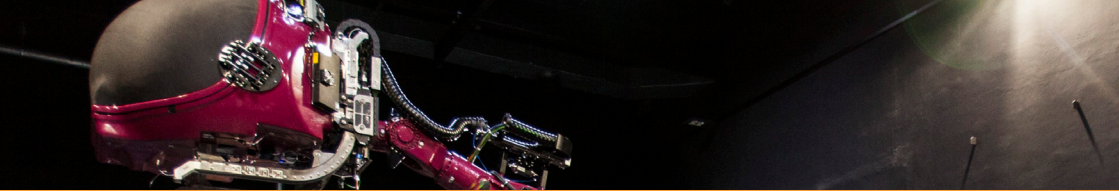
**13.45 Tutorial 2 – Non-obtrusive measurements of attention and workload in steering**

**Lewis Chuang** | Max Planck Institute for Biological Cybernetics, Germany

**14:30 GUIDED TOURS TO SIMULATION FACILITIES**

*>>> please see next page for details >>>*

**19:00 MPI WELCOME RECEPTION BBQ & NEW SIMULATOR INAUGURATION**



	<b>GROUP A</b>	<b>GROUP B</b>	<b>GROUP C</b>
<b>14:30</b>	Transfer to Daimler	Transfer to FKFS	Transfer to MPI
<b>15:00</b>			<b>MPI simulator demo</b>
<b>15:30</b>	<b>Daimler simulator demo</b>	<b>FKFS simulator demo</b>	
<b>16:00</b>			Transfer to Daimler
<b>16:30</b>	Transfer to FKS	Transfer to MPI	
<b>17:00</b>	<b>FKFS simulator demo</b>		<b>Daimler simulator demo</b>
<b>17:30</b>		<b>MPI simulator demo</b>	
<b>18:00</b>	Transfer to Tübingen		Transfer to Tübingen
<b>18:30</b>			
<b>19:00</b>	<b>MPI Welcome Reception</b>		

**GUIDED TOURS: DAIMLER, FKS, MPI**

# THURSDAY, 17 SEPTEMBER 2015

**8:00 REGISTRATION**

**9:00 Introduction**

**Andras Kemeny** | Renault, France

**9:10 Keynote 1: The Role of Driving Simulators in Developing and Evaluating Autonomous Vehicles**

**Erwin Boer** | Entropy Control, University of Leeds, England

## TALK SESSION – PERCEPTION AND HUMAN FACTORS #1

**9:40 Estimation of Driver Distraction Using the Prediction Error of a Cybernetic Driver Model**

**Ameyoe, Ablamvi; Mars, Franck; Chevrel, Philippe; Le-Carpentier, Eric; Illy, Hervé** | IRCCyN ,Renault s.a.s, France

**10:00 Influence of the Headlight Chromaticity on the Driver's Behavior**

**Vidal, Quentin; Michelin, Sylvain; Kemeny, Andras** | University of La Rochelle, France

**10:20 The third dimension: Stereoscopic displaying in a fully immersive driving simulator**

**Forster, Yannick; Paradies, Svenja; Bee, Nikolaus** | BMW, Germany

**10:40 Sensitivity to lateral force is affected by concurrent yaw rotation during curve driving**

**Nooij, Suzanne; Pretto, Paolo; Bülthoff, Heinrich** | Max Planck Institute for Biological Cybernetics, Germany

**11:00 COFFEE BREAK**



## TALK SESSION – PERCEPTION AND HUMAN FACTORS #2

### 11:30 **Effect of Steering Model Fidelity on Subjective Evaluation of Truck Steering Feel**

**Shyrokau, Barys; Loof, Jan; Stroosma, Olaf; Wang, Meng; Happee, Riender** | Delft University of Technology, The Netherlands

### 11:50 **Heart Rate Variability and Sense of Presence Studied in a Driving Simulator**

**Deniaud, Christophe; Honnet, Vincent; Jeanne, Benoit; Mestre, Daniel** | Peugeot Citroën PSA, France

### 12:10 **Pitch tilt rendering for an 8-DOF driving simulator**

**Colombet, Florent; Fang, Zhou; Kemeny, Andras** | THEORIS, France

### 12:30 **(short talk) The role of various sensory cues in self-speed perception: a bicycle riding simulator preliminary study**

**Caro, Stéphane; Bernardi, Silvia** | IFSTTAR, France

### 12:45 **(short talk) Heading Coherence Zone from Causal Inference Modelling**

**de Winkel, Ksander; Katliar, Mikhail; Buelthoff, Heinrich** | Max Planck Institute for Biological Cybernetics, Germany

### 13:00 **LUNCH**

### 14:30 **Symposium – Simulator trends**

14:40 **BhaiTech**, 14:50 **Daimler**, 15:00 **Danisi Engineering**, 15:10 **Darmstadt University**, 15:20 **Desdemona**, 15:30 **Porsche**, 15:40 **University of Stuttgart / FKFS**, 15:50 **Max Planck Institute for Biological Cybernetics**, 16:00 **General discussion**

### 16:30 **COFFEE BREAK**



## TALK SESSION – SIMULATOR DESIGN, TRAINING AND VALIDATION

**17:00 Frequency response and latency analysis of a driving simulator for chassis development and vehicle dynamics evaluation**

**Brems, Willibald; van Doornik, Jelle; de Vries, Edwin; Wiedemann, Jochen Cruden**, The Netherlands

**17:20 A Drive-in, Driver-in-the-Loop Simulator for Testing Autonomous Vehicles**

**Khastgir, Siddartha; Birrell, Stewart; Dhadyalla, Gunwant; Fulker, Dave; Jennings, Paul** | WMG, University of Warwick, United Kingdom

**17:40 A Driving Simulation Platform using Distributed Vehicle Simulators and HLA**

**Andersson, Anders; Andersson Hultgren, Jonas; Leandertz, Rickard; Johansson, Martin; Eriksson, Steve; Jakobson, Ola** | Swedish National Road and Transport Research Institute, VTI, Sweden

**18:00 Potentials and Limitations of Hexapods in Wheeled Mobile Driving Simulators**

**Wagner, Paul; Davoodi, Aschkan; Thomas, Scheibe; Torben, Albrecht; Hermann, Winner; Alexander, Betz** | Technische Universität Darmstadt, Germany

**18:20 A task-oriented catalogue of criteria for driving simulator evaluation**

**Fischer, Martin; Labusch, Andreas; Bellmann, Tobias; Seehof, Carsten** | German Aerospace Center (DLR), Germany

**19:00 DSC SCIENTIFIC COMMITTEE MEETING**

**20:00 CONFERENCE DINNER (RESTAURANT CASINO AM NECKAR)**

# FRIDAY, 18 SEPTEMBER 2015

**8:00 REGISTRATION**

**8:30 Modeling and Visualization of Human Vision Properties and Defects in Driving Simulators using today display technologies**  
**Hasna, Günther** | OPTIS GmbH, Germany

**9:00 Keynote 2: Motion cueing in simulators: a view from the past to the future**  
**Frank Cardullo**, The State University of New York at Binghamton, USA

## TALK SESSION – MOTION CUEING AND CONTROL #1

**9:40 Perception-based motion cueing: validation in driving simulation**  
**Venrooij, Joost; Pretto, Paolo; Katliar, Mikhail; Nooij, Suzanne; Nesti, Alessandro; Lächele, Maria; de Winkel, Ksander; Cleij, Diane; Bülthoff, Heinrich** | Max Planck Institute for Biological Cybernetics, Germany

**10:00 An efficient MPC based motion cueing delay compensation algorithm for driving simulator**  
**Fang, Zhou; Kemeny, Andra** | Renault, France

**10:20 An optimal washout filter based on genetic algorithm compensators for improving simulator driver perception**  
**Asadi, Houshyar; Mohamed, Shady; Nelson, Kyle; Nahavandi, Saeid; Rahim Zadeh, Delpak; Oladazimi, Maysam** | Deakin University, Australia

**10:40 Improvement of an MPC-based Motion Cueing Algorithm with Time-Varying Prediction and Driver Behaviour Estimation**  
**Maran, Fabio; Bruschetta, Mattia; Beghi, Alessandro; Minen, Dieg** | University of Padova, Italy



**11:00 COFFEE BREAK**

## TALK SESSION – MOTION CUEING AND CONTROL #2

- 11:30 Continuous rating of perceived visual-inertial motion incoherence during driving simulation**  
**Cleij, Diane; Venrooij, Joost; Pretto, Paolo; Pool, Daan; Bülthoff, Heinrich; Mulder, Max** | Max Planck Institute for Biological Cybernetics, Germany
- 11:50 The Importance of Yaw Rotation Centre on the Driver Behaviour**  
**Kusachov, Artem; Bruzelius, Fredrik; Augusto, Bruno; Fischer, Martin**  
Swedish National Road and Transport Research Institute, Sweden
- 12:10 (short talk) Simulator Motion-Cueing Requirements for Negotiating a Lane Change across Ice**  
**Boer, Erwin; Jamson, Hamish; Advani, Sunjoo; Horrobin, Anthony**  
Entropy Control Inc., United States of America
- 12:25 (short talk) Enhancing ADAS test and validation with automated search for critical situations**  
**Tatar, Muger** | QTronic GmbH, Germany
- 12:40 (short talk) Motion cueing algorithm to reproduce motorcycle specific lateral dynamics on riding simulators**  
**Guth, Sebastian; Geiger, Michael; Will, Sebastian; Pless, Raphael; Winner, Hermann** | BMW Motorcycles, Germany
- 12:55 (short talk) Impact of MPC Prediction Horizon on Motion Cueing Fidelity**  
**Katliar, Mikhail; de Winkel, Ksander; Pretto, Paolo; Venrooij, Joost; Bülthoff, Heinrich** | Max Planck Institute for Biological Cybernetics, Germany





**13:10 LUNCH**

## TALK SESSION – PERCEPTION AND HUMAN FACTORS #3

**14:20 Head Motion parallax effect on driving performances when using an AR-HUD: Simulation Study on Renault's CARDS Simulator**

**Halit, Lynda; Kemeny, Andras; Le Gougec, Armand; Mérienne, Frédéric; Mohellebi, Hakim** | Renault, France

**14:40 How do the relative distance and deceleration rate of a lead vehicle shape braking response of a following driver? A driving simulator study**

**Saffarian, Mehdi** | University of Toronto, Canada

**15:00 Comparing the Incidence of Simulator Sickness in Five Different Driving Simulators**

**Klüver, Malte; Herrigel, Carolin; Preuß, Stephanie; Schöner, Hans-Peter; Hecht, Heiko** | Daimler AG, Germany

**15:20 (*short talk*) Effect of Yaw Motion on Driver Behaviour during Traffic Circle Turning Manoeuvres**

**Bertolini, Gary Peter; Glaser, Yi; Szczerba, Joseph Frank** | General Motors, US

**15:35 (*short talk*) Simulation of motion parallax by correcting the out-the-window scenery for head position**

**Ledegang, Wietse; Bos, Jelte; Houben, Mark; Groen, Eric** | TNO, The Netherlands

**15:50 CLOSING REMARKS**

**16:00 END OF DSC 2015**

# POSTERS

- 01**     **Evaluation of a new projection concept for the Vehicle in the Loop (VIL) driving simulator**  
**Riedl, Bernhard Josef; Ruger, Fabian; Schuckardt, Christoph; Farber, Berthold**  
Universitat der Bundeswehr, Germany
- 02**     **Reducing the gap between simulated and real life environments by introducing high precision data**  
**Richter, Andreas; Fischer, Martin; Frankiewicz, Tobias; Schnieder, Lars; Koster, Frank** | German Aerospace Center (DLR), Germany
- 03**     **Determining the rider induced roll torque on a dynamic motorcycle riding simulator**  
**Ple, Raphael; Guth, Sebastian; Will, Sebastian; Winner, Hermann**  
TU Darmstadt, Germany
- 04**     **Openscenario - open file format for the cross-functional description of dynamic elements of a virtual driving test**  
**Wang, Ping; Dupuis, Marius; Wossner, Uwe; Walser, Alexander Frederic**  
Automotive Simulation Center Stuttgart e.V., Germany
- 05**     **Motion Cueing in Race-Car Simulators**  
**Salisbury, Ingrid Gael; Limebeer, David** | University of Oxford, United Kingdom
- 06**     **Effect of vr device -hmd and screen display- on the sickness for driving simulation**  
**Aykent, Baris; Merienne, Frederic; Kemeny, Andras** | ENSAM, France
- 07**     **Multisensory driving in younger and older adults**  
**Ramkhalawansingh, Robert; Keshavarz, Behrang; Haycock, Bruce; Shahab, Saba; Campos, Jennifer** | Toronto Rehabilitation Institute, UHN, Canada

- 08**     **The role of multisensory inputs on simulator sickness in younger and older adults during a simulated driving task**  
**Keshavarz, Behrang; Ramkhalawansingh, Robert; Haycock, Bruce; Shahab, Saba; Campos, Jennifer** | Toronto Rehabilitation Institute, UHN, Canada
- 09**     **Anxiety alters visual guidance of braking over time**  
**Geuss, Michael; Ruginski, Ian.; Stefanucci, Jeanine** | Max Planck Institute for Biological Cybernetics, Germany
- 10**     **Reflections virtual management**  
**Petrella, Vincenzo; Pero, Antonio; Liberto, Francesco; Palma, Francesco**  
FCA Fiat Chrysler Automobiles, Italy
- 11**     **Flexible Operation Workflow of a Driving Simulation Center for ADAS Development**  
**Abdelgawad, Kareem; Hassan, Bassem; Kohlstedt, Andreas; Stöcklein, Jörg; Berssenbrügge, Jan; Grafe, Michael; Gausemeier, Sandra; Jäker, Karl-Peter; Trächtler, Ansgar** | University of Paderborn, Germany
- 12**     **Point cloud rendering for interactive simulation**  
**Pena Vina, Eduardo; Reinhard, René; Kleer, Michael; Gizatullin, Andrey; Dreßler, Klaus** | Fraunhofer ITWM, Germany
- 13**     **A literature review on Human Factors research using motorcycle simulators**  
**Kováčsová, Natália; Di Gesu, Maria; Schwab, Arend; Toso, Alessandro; Gubitosa, Marco; Hagenzieker, Marjan; de Winter, Joost** | Delft University of Technology, The Netherlands