

VDI

2nd International VDI Conference -

Automotive Sensor Systems

Sensor Technologies on the Way to Autonomous Driving

February 13-14, 2019, Munich, Germany

- Challenges & Trends in ADAS Sensing Technologies
- Innovations and future Requirements for Sensor Systems
- Functional Safety and Automotive Security Challenges
- The Role of AI in processing and interpreting Sensor Data
- The regulatory Framework & Development of Standards
- Excursus: Driver Monitoring

+ Interactive World Café Session

+ International VDI Workshop: Satellite Navigation 2.0

Keynotes from
Apple & Velodyne

Meet international Experts from:



An event organized by VDI Wissensforum GmbH
www.vdi-international.com/01K0921019



08:00 Registration & Welcome Coffee

09:30 Chair's Welcome and Opening Address

Dipl.-Ing. Holger Meinel, Independent Automotive Radar Expert, Germany

I. The Future Road - Where are we heading with ADAS Sensing Technologies?

09:45 ADAS Sensor Market & Technology Trends

- Overview of the sensors needed for ADAS and its market value
- Roadmap and technology evolution of the main ADAS sensors
- Players landscape and supply chain evolution

Market Insights

Cédric Malaquin, Market & Technology Analyst, Yole Développement, France

10:15 ADAS Sensor Systems - Challenges, Trends and Technologies towards Automated Driving

- Challenges in ADAS sensor systems from a Tier 1 perspective
- Trends, innovations and key technologies in ADAS sensing
- Systematic combination and topologies of sensor technologies

Dr.-Ing. Martin Pfitzner, Head of Sensor Networks, Continental AG, Germany

II. Innovations and future Requirements in ADAS Sensing Technologies

10:45 Multi-Domain LiDAR Sensing

- Super-Resolution LiDAR processing
- Multi-Domain data fusion
- Point-wise classification

Raul Bravo, CEO, Dibotics, France

11:15 Staying ahead of the Curve: Advancing Radar and the Future of Autonomous Driving

- The overlooked sensor gap to reaching level 4 and 5 autonomy
- How next-generation radar is an unexpected solution
- Challenges in the engineering of a high resolution automotive radar
- Resolving ambiguities and achieving low false alarm rates
- Coping with mutual radar interference

Dr. Yoram Stettiner, CSO, Arbe Robotics, Israel

11:45 A centralized Environment Model as an Enabler for Assisted and Automated Driving

- Strategical and technical requirements and design principles
- Technical realization and usage for different DAS/AD functions
- Lessons learned from series development

Dr.-Ing. Mirko Mählich, Senior Manger and Head of Development Environment Model and Map-Learning for Automated Driving, Audi AG, Germany

12:15 Lunch

13:30 Camera based Lane Change Assistant for mirrorless Cars

- Optimizing the driver's view with cameras replacing vehicle rear-view
- Integration of various algorithms into a Camera Monitor System (CMS)

- Using the CMS for collision avoidance and blind spot detection
- Advantages, disadvantages and system limits

Dr.-Ing. Florian Baumann, Technical Director, ADASENS Automotive GmbH, Germany

14:00 Near-Field 3D Sensing based on Ultrasound

- Using ultrasonic echolocation for real-time 3D object detection
- Covering edge-cases: Where ultrasound fits in the sensor stack
- Sensor data examples and applications

Tobias Bahnemann, Managing Director & Co-Founder, Toposens GmbH, Germany

14:30 Interactive World Café Session (Exemplary Topics)

- Ultrasound sensor vision for automotive applications
- Differences in the sensor sets from level 3-4
- Validation of AI / Sensor data for AV
- Hardware for next generation millimeter wave automotive radar sensor

World Cafés

15:30 Networking & Coffee Break

III. Legal Framework, Functional Safety and Security Challenges

16:00 The AUTOSAR joint Platforms for Autonomous and Connected Vehicles

- Introduction to automotive open system architecture
- Standardization of software platforms
- The context of safety and security and handling of sensor systems
- Outlook and roadmaps

Dr.-Ing. Thomas Scharnhorst, Spokesperson, AUTOSAR Development Partnership, Germany

16:30 Legal Challenges for Autonomous Driving and ADAS

- Status quo: What is legally possible in ADAS?
- Legal risks and implications for OEMs and further stakeholders
- Assessing the question of liability

Dr., LL.M. Andreas Eustacchio, Attorney at Law, Partner, EUSTACCHIO Rechtsanwälte – Attorneys at Law, Austria

17:00 Functional Safety for Automated Driving

- SOTIF: Status quo and future developments
- The relation of SOTIF and ISO26262
- Machine learning and functional safety

Thomas Weispfenning, Senior System Safety Engineer, Opel Automobile GmbH, Germany

17:30 Threats and Solutions in Automotive Sensors - GNSS and LiDAR

- Vulnerabilities in automotive sensors and incidents analysis
- In depth analysis and research of LiDAR threats and protection solutions
- OEM and Tier 1 best practices for sensor safety and security
- Outlook on sensor 2.0 and definition of sensor cyber security in regulation

Gal Cohen, M.Sc., VP R&D, co-author: Yoav Zangvil, B.Sc., CTO & co-Founder, both: Regulus Cyber, Israel

18:00 End of Conference Day One



Get-Together

At the end of the first conference day we kindly invite you to use the relaxed and informal atmosphere for in-depth conversations with other participants and speakers.

Thursday, February 14, 2019

2nd day

IV. Testing, Simulation & Validation of Sensor Functions and ADAS Systems

09:00 Advanced Safety LiDAR Solutions and Opportunities in their Testing and Validation

- Overview on advanced LiDAR solutions
- Market segmentation and specific requirements for LiDAR
- LiDAR component testing and system validation
- Safety and standardization implications for LiDAR

Keynote

Dr.-Ing. Mircea Gradu, Chief Quality Officer, Velodyne LiDAR, President SAE International, USA

09:30 Enabling virtual Product Validation: Standards for the Development of Autonomous Driving

- Standardization of the tool chain
- Integration and development of models
- Outlook on the future ecosystem for validation

Carlo van Driesten, M.Sc., Project Lead Virtual Test & Validation, BMW AG, Germany

10:00  Networking & Coffee Break

10:30 Collision Detection Systems for Future Robots and Vehicles inspired by Insects

- Collisions lead to fatalities or other social consequences
- Building trustworthy collision detection systems
- Inspiration from insects' visual pathway shed lights on reliable solutions

Prof. Shigang Yue, Professor in Computer Science, University of Lincoln, UK

Out of the Box

V. Excursus: Driver Monitoring

11:00 Eyetracking on the Way to fully Autonomous Vehicles

- Technology and principles of driver monitoring systems
- Sensing based on deep learning and vision processing
- Sensing use cases related to safety, comfort and autonomous

Henrik Lind, Chief Research Officer, Smart Eye AB, Sweden

11:30 Attention Sense: Coffee Break Estimation for Truck Drivers

- Types of inattentive driving and its role in traffic accidents

- Causes of inattentive driving and methods to detect it
 - Inspection for the detection method based on "driving performance" and selection of key features
 - Results obtained with Ford Cargo truck by using key features
- Dr. Oguz Icoğlu**, R&D Engineer, co-author: Dr. İlhan Kubilay Yalci, R&D Engineer, both: Ford Otosan, Turkey

12:00 3D Eye Tracking for Level 5 HMI

- Introduction to 3D eye tracking
- Using consumer depth sensing cameras to track eye-gaze
- Automotive use cases: Driver monitoring and assistance

Bastjan Prenaj, Co-founder and CBDO, Eyeware, Switzerland

12:30  Lunch

VI. The Role of AI in interpreting Sensor Data & its Impact on ADAS Applications

13:30 Deep Learning in Sensors: The New Big Data

- Why data science and deep learning are so hot?!
- Sensor data is a gold mine
- IoT and sensors making a better life
- Time series data: A novel method to make predictions

Keynote

Mohammad Shokoohi-Yekta, PhD, Senior Data Scientist and Adjunct Faculty, Apple Inc. and Stanford University, USA

14:00 AI, Insurance and Automotive Safety – Using AI to Increase Road Safety

- Using AI to create insurance policies that nudge people into smart driving behavior
- Correlating behavior to risk with pattern profiling
- The power of prediction: How AI can increase road safety
- Human vs. machine: The challenges and opportunities of AI in autonomous vehicles

- Way forward: The future of AI within car insurance

Liselott Johansson, CEO, Greater Than AB, Sweden

14:30 3D Computer Vision for Self-Driving Cars

- Leveraging camera sensors to create realtime large-scale 3D maps and localization (SLAM)
- Technologies enabling the most accurate realtime capable visual SLAM solutions
- Cameras can complement lidar sensors, offering a low-cost solution with high data rate

Prof. Dr. Daniel Cremers, Chair of Computer Vision & Artificial Intelligence, TUM and Co-Founder & CSO, Artisense Corporation, Germany

15:00 Conference Chair's closing Remarks

15:15 End of Conference

Satellite Navigation 2.0

Workshop Chair:

Gal Cohen, VP R&D Automotive Sensor Cyber Defense Department,
Regulus Cyber, Israel

Date and Venue:

February 12, 2019
Munich

10:00-16:00

This workshop provides an overview of the technologies and methodologies behind automotive navigation systems and discusses where the industry is heading with GNSS technology embedded in AV's. As the only source of absolute position, velocity and time, GNSS play a critical role. However, the next levels of autonomy (3-5) will require a smart fusion between the different sensors in the car with the onboard GNSS system with high accuracy and up to date information. The workshop will explore new developments in sensor fusion, SLAM techniques and GNSS cyber defense for jamming and spoofing as the next step for Navigation 2.0 for driverless cars. The core components of smart navigation systems will be introduced and the challenges and opportunities of vehicle location, safety-reliability standards and requirements for OEMs, Tier 1, sensor manufacturers and regulators will be discussed. Participants are invited to actively contribute during the sessions and Q&A's.

Introduction

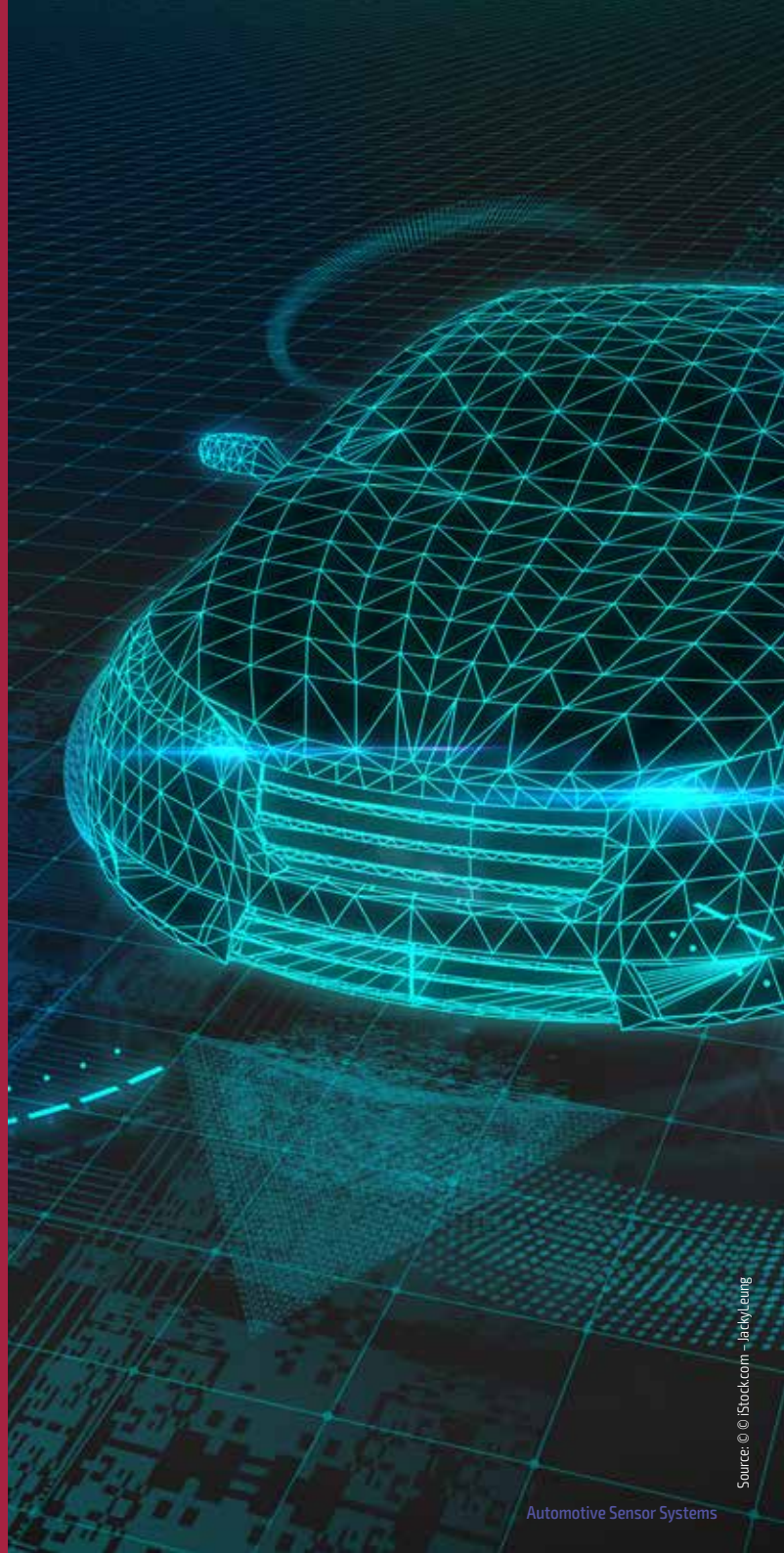
- History of navigation systems & overview of GNSS navigation technology
- Major constellations used in GNSS: GPS, BeiDou, Galileo, Glonass
- Key players and stakeholders in automotive GNSS
- GNSS systems strength and vulnerabilities analysis
- Introduction to most common automotive sensors & sensor and map fusion
- Maps self-healing method

Discussion Groups – Topics include:

- Hacking the future vehicle's location - presenting and discussing various threat scenarios on the low signal strength of GNSS reception and the resulting vulnerabilities
- Security requirements and best practices for safe satellite based navigation for driverless technology
- Reliability standards for trusted and effective GNSS signal and fusion with other sensors

Future Outlook, Discussion and Conclusion

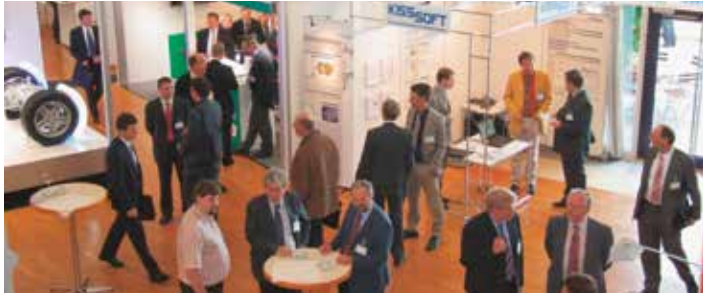
(Please note that the number of participants is limited. Registrations and individual parts and segments of the workshop are subject to confirmation.)



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Please submit your topic to:

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Conference venue

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You will find more hotels
close to the venue at
www.vdi-wissensforum.de/hrs

Hotel room reservation: A limited number of rooms has been reserved for the benefit of the conference participants at the The Rilano Hotel München, +49 89/36001-0 or info@rilano.com.

Please refer to "VDI Conference". For more hotels: www.vdi-wissensforum.de/hrs

VDI Wissensforum service package: The conference package includes the conference documents (online), beverages during breaks, lunch and the get together on February 13, 2019.

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Yes, I will participate as follows:

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VDI Conference 13.-14.02.2019
(01K0921019) € 1790

and/or

Workshop 12.02.2019
(01ST926001) € 950

and/or

Package Price (Please tick the boxes)

(Conference + 1 Workshop) € 2460

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