



## Location

CCG-Center, Technologiepark Argelsrieder Feld 11,  
82234 Wessling-Oberpaffenhofen, Germany

A list of nearby accommodations, a description of the location and hints for travel will be mailed to the participants upon registration. Please make your own hotel accommodation.

## Fee

EUR 1.690,-

Please pay by non-cash means after receiving the invoice.

CCG is a non profit organisation, exempt from value-added tax.

Members of CCG receive a 10 % discount and students a 75 % discount when they present their student card. If several employees of a company / department register for the same seminar, each receives a 10 % discount. The discounts cannot be combined.

## Registration

Please write or call (up to 14 days before the seminar) to Carl-Cranz-Gesellschaft e.V.; Postfach 11 12, D-82230 Wessling  
Tel. +49 (0) 8153 / 88 11 98 -12, Fax -19, E-Mail: anmelden@ccg-ev.de  
Internet: [www.ccg-ev.de](http://www.ccg-ev.de)

After receipt of registration, a confirmation letter will be sent.

## Further Information

For more information about our organization please do not hesitate to contact the CCG at Oberpaffenhofen at the phone number given above.

For more information on the content of the seminar please contact Prof. Dr.-Ing. Arno Schroth  
Carl-Cranz-Gesellschaft e.V.  
Postfach 11 12, D-82230 Weßling  
E-Mail: [arno.schroth@ccg-ev.de](mailto:arno.schroth@ccg-ev.de)

## Substitutions and Cancellations

Substitutions may be made at any time. Cancellation of an accepted registration made up to 7 days prior to the start of the seminar is subject to a EUR 25,- administrative fee. Participants canceling after that date are responsible for the entire seminar fee.

## Who Should Attend

Employees from industry, authorities, research institutes, service providers, and armed forces who are involved in design, development, simulation, test, and evaluation of automotive components and systems in the field of road, and rail.

## Focus

The objective of an EU sustainable transport policy is that the European transport systems meet society's economic, social, and environmental needs. Effective transport systems are essential to Europe's prosperity. Despite the outstanding importance of (road) safety, congestion problems must not be neglected. Congestion does not only cause considerable loss of time resulting in unnecessary costs. It is also the reason for substantial environmental problems. Vehicle-to-vehicle and vehicle-to-infrastructure communication in combination with advanced sensors as well as satellite navigation is expected to be a powerful mean to improve safety and to reduce congestion problems. The seminar focuses on road and rail Aeronautical aspects are dealt in a series of other CCG-seminars. The main topics of the seminar are: Introduction on different communications and positioning (navigation) techniques relevant for traffic telematics; vehicle-to-X communications use cases; architectures for vehicle-to-vehicle and vehicle-to-infrastructure communications; need for common architectures for cooperative systems; components of communications and navigation technology; integrated simulation models; description of actual illustrative European projects; typical sensors; sensor fusion; test tools and methods for impact assessment. The simulation tools will be demonstrated in detail, exercises will be performed. Finally, demonstrations utilizing road vehicles will conclude the seminar.

## Lecturers

T. Kosch	Dr.	BMW Group Forschung und Technik GmbH, München
R. Raßhofer	Dr.-Ing.	
M. Strassberger	Dr.	
M. Meyer zu Hörste	Dr.-Ing.	DLR Braunschweig, Institut für Verkehrssystemtechnik
F. de Ponte Müller		DLR Oberpaffenhofen, Institut für Kommunikation und Navigation
M. Röckl		
T. Strang	Prof. Dr.	

## Language

English

Each attendant will be provided with detailed course material in English.

## Seminar FA 4.11

# Communications and Navigation in Traffic Telematics

November 8 – 11, 2010  
Oberpaffenhofen near Munich

## Scientific Coordination

Prof. Dr.-Ing. Arno Schroth  
Carl-Cranz-Gesellschaft e.V.  
Oberpaffenhofen

## Seminar Outline

### Monday, November 8, 2010 10.15 – 16.30

- 10.15 – 10.30 Introduction
- 10.30 – 11.15 **Car (vehicle) – to-X communications use cases**  
M. Strassberger Motivation and illustration of the various applications in the fields of active safety, right-in-time driver warning, real-time traffic information, efficient traffic management, cooperative traffic signals and a plethora of infotainment services, details on the potential of the technology for the different use cases
- 11.15 – 12.00 **Architectures for car-to-car and car-to-infrastructure communications**  
M. Strassberger Explanation of the actors, entities and technical system modules, their roles and interactions, in-vehicle and roadside architectures, backend infrastructure, protocol, security and hardware architectures
- 13.00 – 14.30 **Components of communications and navigation Technology**  
M. Strassberger Physical interfaces, communication control, messaging, beaconing, map matching, situation assessment, dynamic information bases, distributed digital maps
- 15.00 – 16.30 **Information Modelling**  
M. Strassberger Modelling of distributed information considering spatio-temporal data, inaccuracy and uncertainty

### Tuesday, November 9, 2010 08.30 – 16.30

- 08.30 – 09.15 **Cellular vehicle communications**  
N.N. UMTS as a means for car-to-car communications and value-added services
- 09.15 – 10.00 **Broadcast based telematics**  
T. Strang RDS-TMC, TPEG, (x)FCD

- 10.30 – 12.00 **Introduction on different communications and positioning (navigation) techniques relevant for traffic telematics**  
M. Röckl physical and MAC layer concepts, e.g. channel management and congestion control, Car2X network protocol concepts, especially position-based communications, positioning requirements and techniques for navigation and driver assistance
- 13.00 – 14.30 **Standardisation at ETSI, IEEE and ISO**  
T. Kosch Existing draft standards of the IEEE (802.11p, 1609.x) and the SAE (J2735), standardization at ISO, the new ETSI WG ITS, co-operation between the institutions, the role of the Car2Car Communication Consortium, frequency regulation
- 15.00 – 16.30 **Description of actual illustrative European projects**  
T. Kosch Information on European projects taking perspectives of car manufacturers and road authorities, co-operation between these projects, the European common system architecture framework, current prototype system modules, ongoing and planned testing and field trial activities
- approx. 17.30 **Social Event**  
Guided tour through the city center of Munich (voluntary)

### Wednesday, November 10, 2010 08.30 – 16.30

- 08.30 – 10.00 **Automotive perception sensors**  
R. Raßhofer Overview and applications, radar, lidar, and ultrasonic sensors, mono and stereo video camera systems, near- and far-infrared camera systems, ranging camera systems (3D), cooperative sensors
- 10.30 – 11.15 **Introduction to sensor fusion**  
M. Röckl Sensor independence, static and dynamic estimation theory, Bayesian networks, particle filter, other useful techniques

- 11.15 – 12.00 **Sensor fusion in vehicles**  
M. Röckl Applied sensor fusion on the example of RADAR and C2C communications, cooperative adaptive cruise control, value of information
- 13.00 – 13.45 **Integrated simulation models**  
T. Kosch Wireless network simulation, traffic simulation, driving simulators, techniques to combine different simulators, simulating different system properties (e.g. message dissemination, channel saturation, effectiveness of security measures), assessment of traffic effects
- 13.45 – 15.15 **Introduction to traffic simulation**  
M. Röckl Introduction to the SUMO traffic modeling simulator followed by hands-on experiments by the participants
- 15.45 – 16.30 **Test tools and methods for impact assessment**  
F. de Ponte Müller Overview of tools developed in relevant projects, including live demo of CODAR Viewer & SoL Car

### Thursday, November 11, 2010 08.30 – 15.00

- 08.30 – 10.00 **Components and architectures for Rail Navigation**  
M. Meyer zu Hörste Physical interfaces, architectures for safety and availability, concept of Balises, map matching, situation assessment, dynamic information bases, digital maps: generation and distribution
- 10.30 – 12.00 **Components and architectures for Rail Communication**  
M. Meyer zu Hörste Physical and logical interfaces, architectures for safety and reliability, use of grey channels for safe applications, supervision
- 13.00 – 14.30 **New approaches and developments**  
M. Meyer zu Hörste Information on recent projects with relation to rail communication and navigation. New approaches and needs caused by European Initiatives
- 14.30 – 15.00 Concluding Remarks and Discussions