Carl-Cranz-Gesellschaft (Academy)

Carl-Cranz-Academy e.V. (CCG) is one of the leading institutions for postgraduate education and training. It has conducted technical and scientific seminars in Germany and abroad for 50 years. Apart from major enterprises and SMEs, its clients are also German and foreign authorities and increasingly European institutions.

Seminars impart up-to-date, practice-oriented knowledge. Topics offered at these one to five-day events range from introductions to new fields through comprehensive presentations of principles to in-depth treatment of special topics and latest research, development and application results. Seminars are mainly held in German; as the international demand ist increasing seminars in English are offered as well. They are conceived for experts and executives, scientists and specialists from industry and research, from authorities and the armed forces.

CCG works closely with research institutions, universities, industry, authorities and the armed forces. Lecturers are leading scientists and experts from Germany and abroad.

Further Information

For further information and detailed programmes, please contact:
Carl-Cranz-Gesellschaft e.V.
Technopark
Argelsrieder Feld 11
82234 Wessling-Oberpfaffenhofen
Tel. +49 (0) 8153 / 88 11 98–0
Fax +49 (0) 8153 / 88 11 98–19
E-Mail ccg@ccg-ev.de

Internet www.ccg-ev.de

Seminar Registration

Up to 14 days before the seminar begins
by telephone, email, fax or via the internet

Seminars on Satellite Navigation

Special field: Satellite Navigation

Satellite navigation systems are more and more in use in different applications. Daily life in future will be inconceivable without them. The focus is currently on automotive applications, guidance and location based services but their use in industrial applications is now growing too.
Navigation receivers at present are working primarily on the basis of the American GPS system (Global Positioning System). The Europeans are currently realising the Galileo civil satellite navigation system as part of a global satellite navigation system (GNSS). Special interest will be given to the robustness und vulnerability of the system. For safety critical applications new methos of integrity monitoring and axiliary systems will be considered.
A new, emerging trend is the use of an integrated complex of navigation, communication and recording of geodata with service-specific satellites to develop innovative applications and services. This is giving rise to some entirely new aspects in the following fields:

- Global influencing systems: universal navigation and positioning for all types of moving objects, traffic monitoring and control, dynamic routing, fleet management
- Regional location based services: local weather forecast, local M-commerce, travel assistance, tourism guidance
- Recording and use of geo data: status monitoring of the Earth's surface, optimisation of agricultural processes, prospection for resources, detection of changes or deposits, planning of traffic routes etc.
- Dealing with dangers and crises: search and rescue operations, global logistics support in crises, safe management of groups of persons, identification and location of dangerous environmental pollution
- Precision location, time dissemination: replacement of classical land surveying, global time dissemination, synchronisation of time multiplex in communications, of processes resp. observations in radio astronomy and geophysics, and of switching operations in the supply of energy.

Carl-Cranz-Academy is staying abreast of these important developments, and has for quite some time incorporated in its programme a series of seminars on this subject area given by international experts under the scientific coordination of Professor Dr.-Ing. Arno Schroth. These seminars deal with theoretical principles, analyse the current status and in particular present trends and developments expected in the future. They provide executives and specialists with an overview of specific fields or in-depth knowledge on special topics.

Carl-Cranz-Gesellschaft e.V. | Wessling
Association for Continuing Education in Engineering

Seminars on Satellite Navigation in 2012

Scientific Coordination

Prof. Dr.-Ing. habil. Arno Schroth
German Aerospace Center
Institute of Communications and Navigation
Oberpfaffenhofen near Munich

Satellite Navigation

Principles of Satellite Navigation and GPS Modernization

Dr. J. Furthner, DLR, Oberpfaffenhofen (scientific coordination)
09.–12.10.2012

Introduction to the basics of satellite navigation, system overview, navigation solution, orbit description • Systems requirements and their applications • Status and future of current systems • Communication principles of Galileo and GPS, signal representation, spreading code process, correlation and multiple access, channel models for air and sea resp. land traffic • Principle of navigation receivers, signal acquisition and synchronisation via code and carrier phase, market overview of different applications • Concept of integrity, requirements of applications • Antenna design and use in navigation • Disturbances and models of atmospheric propagation effects • Causes and reduction methods for multipath effects • Timekeeping in navigation systems • Local/Global support systems and concepts DGNSS, EGNOS/WAAS • Reference systems and their transformations • Military applications, interference resistance, encryption • Development status and Galileo schedule

Seminar language: German · Location: Oberpfaffenhofen
€ 1.710,— (exempt from VATi)

Galileo

Prof. Dr.-Ing. B. Eissfeller, University of the Armed Forces Munich, Neubiberg (scientific coordination) **08.–10.05.2012**

In the seminar a detailed presentation of programmatic, institutional and technical aspects of the European satellite navigation system GALILEO is provided. In particular, the service concept, signal and frequency plan, overall architecture, integrity concept, the Galileo system time generation, design options and support activities are outlined. Similarities and differences with respect to the American GPS system are emphasized.

Seminar language: English · Location: Oberpfaffenhofen
€ 1.345,— (exempt from VAT)

Indoor Navigation

Dr.-Ing. G. Heinrichs, IfEN GmbH, Poing (scientific coordination)
04.–06.12.2012

In the last few years, interest in indoor navigation has expanded significantly. Various emerging applications require positioning of users indoors. One of the most important potential applications of indoor navigation is emergency call location in cellular telephone networks, for which both availability and accuracy are critical. This is particular important in the light of the emergency call regulation E-911 in the U.S.A. and the E-112 directive of the European Commission. Furthermore, the increasing demand for personal navigation and location-based services is in addition driving research and development of indoor localization and positioning.

Thus, the seminar is focused on the fundamentals related to indoor navigation and on the architecture of state-of-the art and future navigation systems for indoor localization and positioning. In the first part of the course the basic challenges of as well as the key algorithmic technologies for indoor navigation are presented (High-Sensitivity GALILEO/GPS, Assisted GNSS, Cellular and Wireless Network positioning, RFID, Hybrid Positioning). In the second part case studies for future-oriented application fields will be outlined. The course should help to understand the challenges as well as the limitations of indoor navigation systems.

Seminar Language: English · Location: Oberpfaffenhofen
€ 1.345,— (exempt from VAT)

Robustness and Vulnerability of Satellite Navigation

Dr. L. Brötje, Fraunhofer FKIE, Wachtberg; Dr. A. Konovaltsev, DLR, Oberpfaffenhofen (scientific coordination) **27.–29.11.2012**

Introduction to GNSS: Basics of satellite navigation • Overview of current and future GNSS (e.g. GALILEO, modernized GPS) • Vulnerability of GNSS to Interference and Jamming • Detection and Suppression of Multipath • Benefits of integrated Systems/Hybrid-Systems: GPS/GALILEO , GNSS/INS-Integration • Sensor-Fusion • Application examples, e.g. Aviation, Search and Rescue

Seminar language: German · Location: Oberpfaffenhofen
€ 1.365,– (exempt from VAT)

Augmentation Systems for Reliable Satellite Navigation

Dipl.-Ing. B. Bellabas, DLR, Oberpfaffenhofen
(scientific coordination) **12.–14.11.2012**

Introduction to satellite navigation, error sources, performance criteria, integrity, continuity, accuracy, availability, protection level concept, EGNOS, WAAS, SBAS, satellite based augmentation systems, threats, safety-critical navigation, ground based augmentation systems, GBAS, LAAS, robust navigation, integrity monitoring, differential GNSS, aeronautical navigation, ABAS, RAIM, ionospheric gradients, certification, standardisation, ARAIM, RRAIM, AAIM, GPS, Galileo, inertial navigation, multi-frequency GNSS integrity, multi-constellation integrity, ISM, integrity support message, GBAS demonstration, commercial and experimental GBAS, multipath error, propagation effects, interfrequency bias, interference suppression

Seminar language: German · Location: Oberpfaffenhofen
€ 1.345,– (exempt from VAT)

GPS/INS-Integration and Multisensor-Navigation

Prof. Dr.-Ing. B. Eissfeller, University of the Federal Armed Forces Munich (scientific coordination) **12.–16.11.2012**

Introduction to GNSS: Basics of satellite navigation • Overview of current and future GNSS (e.g. GALILEO, modernized GPS) • Vulnerability of GNSS to Interference and Jamming • Detection and Suppression of Multipath • Benefits of integrated Systems/Hybrid-Systems: GPS/GALILEO , GNSS/INS-Integration • Sensor-Fusion • Application examples, e.g. Aviation, Search and Rescue

Seminar language: English · Location: Oberpfaffenhofen
€ 1.890,– (exempt from VAT)

Locating Technologies for Industrial and Commercial Applications

T. von der Grün, Fraunhofer IIS, Nuremberg; Prof. Dr.-Ing. J. Thieleke, Friedrich-Alexander-University Erlangen-Nuremberg
(scientific coordination) **12.–13.06.2012**

This seminar enhances the technical understanding of a variety of radio-based technologies to locate a person or an object within specific environments like buildings, halls, sports facilities or even whole city districts. The seminar focuses on cooperative locating systems, i.e. systems that require an electronic module like a PDA or a mobile phone with WLAN, a RFID tag or a transponder to perform locating measurements.

Firstly, all locating systems are introduced by categorizing them according to their essential characteristics. For instance, the positioning of an object within an existing WiFi network can be carried out on the basis of field strength measurements, following the principle of fingerprinting. Also neighbour relationships between distributed sensor nodes allow to locate the nodes. Other technological concepts use the information given by the angle of arrival or the propagation delay of a radio frequency signal from the transmitter to the receiver. The discussion of the manifold of localization technologies will be complemented by the presentation on satellite navigation, especially considering Galileo.

Additional information gained from sensor modules help locating systems to increase their availability and performance in situations that affect wireless signal transmission. Furthermore standardization activities with respect to different aspects of localization will be discussed.

Specific contributions present the measurement principles and their technical implementation. The seminar blocks will be supplemented by specific application examples and experience reports.

Seminar language: German · Location: Nuremberg
€ 1.045,– (exempt from VAT)