NORTH ATLANTIC TREATY ORGANIZATION

SCIENCE AND TECHNOLOGY ORGANIZATION

LECTURE SERIES
SET-197

on "Navigation Sensors and Systems in Global Navigation Satellite Systems (GNSS) Degraded and Denied Environments"

sur "Systèmes et capteurs de navigation dans un contexte de navigation par satellite (GNSS) dégradé ou indisponible (GNSS) "

organized by the

Sensors and Electronics Technology Panel

to be held in

Brussels (BEL) on 21-22 October 2013
Porto (PRT) on 24-25 October 2013
Rome (ITA) on 28-29 October 2013
Ankara (TUR) on 31 October-1 November 2013

This Lecture Series is open to citizens from NATO, Partnership-for-Peace (PfP) Nations and Australia

Latest Enrolment Date

NATO Nations	**2 weeks prior LS date**
PfP Nations and Australia	**3 weeks prior LS date**

Enrol on-line at **http://www.cso.nato.int**

All presentations and discussions will be held in English.

Background

The mission of STO is to conduct and promote co-operative research and information exchange. STO consists of a three level organization: the Science and Technology Board (STB), the Panels and the Technical Teams. The Sensors and Electronics Technology (SET) Panel is one of the seven Panels under the STB.

The SET Panel mission is to advance technology in electronics and passive/active sensors as they pertain to reconnaissance, surveillance and target acquisition, electronic warfare, communications and navigation; and to enhance sensor capabilities through multi-sensor integration/fusion. This concern the phenomenology related to target signature, propagation and battle space environment, EO, RF, acoustic and magnetic sensors, antenna, signal and image processing, components, sensor hardening and electromagnetic compatibility.

Theme

Position, velocity, and timing (PVT) information from Global Navigation Satellite Systems (GNSS) is used throughout the NATO forces but the availability of GNSS signals in conflicts or other difficult environments has become a subject of great concern. Indeed, there have been numerous study groups, symposia, and recommendations presented during the last 20 years. This is a particularly difficult problem that still requires new and innovative ideas to fill the PVT gap when GNSS data are degraded or unavailable. This Lecture Series will present the state-of-the art technology used in addressing these challenges and provide a forum for discussions with technical experts. Through this lecture series the technical community will be updated on current application techniques and possible near-term and future solutions.

Thème

Les données de position, de vitesse et de ré temporelle (PVT) provenant des systèmes mond navigation par satellite (GNSS) sont utilisé l'ensemble des forces de l'OTAN, mais la disp des signaux GNSS dans les environnements de ou autres environnements difficiles est deven préoccupante. En réalité, ces 20 dernières ann nombreux groupes d'étude et colloques ont eu lie nombreuses recommandations ont été présentée sujet. Il s'agit d'un problème particulièrement épin fait encore appel aux idées nouvelles et à l'inr pour combler le manque d'information PVT lors données GNSS sont dégradées ou indisponibles série de conférences présentera la technologie de employée pour relever ces défis et constituera un de discussion avec les experts techniques. Tout de cette série de conférences, la communauté te sera informée des techniques actuelles mises en et des solutions possibles à court et long terme.

Lecture Series Director

Dr. George Schmidt (USA)
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Lecturers

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LECTURE SERIES PROGRAMME

DAY ONE

8:30	Registration
9:00	Opening Ceremony & STO Overview **National authorities**
9:15	Introduction and Overview **Dr. George Schmidt**
9:30	Navigation Sensors and Systems in GNSS Degraded and Denied Environments **Dr. George Schmidt**
10:30	Break
11:00	High-Sensitivity GNSS Limitations in RF Perturbed Environments **Prof. Gerard Lachapelle**
12:00	Lunch Break
13:30	Contemporary and Emerging Inertial Sensor Technologies **Mr. Ralph Hopkins**
14:30	Determining Absolute Position Using 3-Axis Magnetometers and the Need for Self-Building World Models **Prof. John Raquet**
15:30	Break
16:00	Nonlinear Estimation Techniques for Navigation **Dr. Michael Veth**
17:00	End of day 1

DAY TWO

9:00	Miniature Augmentation Sensors in GNSS-Denied Navigation Applications **Mr. Ralph Hopkins**
10:00	Morning Break
10:30	High Precision GNSS RTK Navigation for Soldiers and Other Military Assets **Prof. Gerard Lachapelle**
11:30	Navigation Using Pseudolites, Beacons, and Signals of Opportunity **Prof. John Raquet**
12:30	Lunch Break
14:00	Statistical Predictive Rendering for Robust Passive Relative Navigation **Dr. Michael Veth**
15:00	Round table discussion **All Delegates**
15:30	Afternoon Break
16:15	Concluding Remarks **Dr. George Schmidt**
16:30	End

APPLICATION TO ENROL
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Note: if you enrolled for other RTO-STO activities in the past, please use the same e-mail address as previously. If your e-mail address has changed, please inform the STO-CSO contact before enrolling.

Once your enrolment has been validated, you will receive a General Information Package with the latest information on travel, accommodation and local arrangements. Please note that participants are to make their own travel arrangements and hotel bookings.

If you are unable to enrol via the internet, please contact the CSO enrolment coordinator: **Anne Reboul** - anne.reboul@cso.nato.int

Please respect the following dates for enrolment:

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NATO Nations	**2 weeks prior LS date**
PfP Nations & Australia	**3 weeks prior LS date**

Contact/Enrolment Coordinator

NATO Collaboration Support Office (CSO)

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