

## **Distinguished Lecture Tour**

**Organized by**

**The IEEE Benelux Joint Chapter on Communications and Vehicular  
Technology,**

**4,5 and 6 June 2013 in Gent, Luxembourg and Twente, respectively**

In order to promote the activities of IEEE Communications and Vehicular Technology in the Benelux and in the frame of the IEEE distinguished lecturer tours, the IEEE Benelux Chapter on Communications and Vehicular Technology has organized a Distinguished Lecture Tour in Belgium, Luxembourg and the Netherlands from 4 to 6 June 2013. In this period Prof. Alexander Wyglinski (from Worcester Polytechnic Institute, MA, USA) will provide a series of talks in Belgium, Luxembourg and the Netherlands. Here below is the announcement with more details:

### **Tutorial in Gent on 4 June 2013**

#### **Vehicular Communications and Networks Employing Cognitive Radio**

Speaker: Alexander M. Wyglinski, Worcester Polytechnic Institute, USA

Date & Time: Tuesday 4 June 2013 at 10:00 hrs

Location: Jozef Plateauzaal, Plateaustraat 22, Faculty of Engineering and Architecture, Ghent University, Ghent, Belgium

Directions: [www.ugent.be/ea/en/contact](http://www.ugent.be/ea/en/contact)

Vehicular networking possesses significant potential for enabling diverse applications associated with traffic safety, traffic efficiency and information provisioning. As the automotive sector continues to evolve and electronic devices become smaller and more powerful, new features are being introduced into the next generation of vehicles. Consequently, we can expect that vehicular communications will become ubiquitous in the foreseeable future, resulting in a significant increase in the bandwidth required by various applications. However, the issue of wireless spectrum scarcity presently faced by modern society may impose limitations on the amount of bandwidth available to support these vehicular networking applications, thus potentially inhibiting growth in this sector. For generic wireless applications, one solution that has been proposed to remedy the wireless spectrum scarcity issue is the Dynamic Spectrum Access (DSA) paradigm, where secondary user wireless applications temporarily “borrow” unoccupied wireless bandwidth while simultaneously minimizing their interference to nearby primary user transmissions. In this presentation, an extension of the DSA paradigm to a vehicular transmission environment, referred to as Vehicular DSA or VDSA, will be presented along with the latest research developments and findings.

## **Tutorial in Luxembourg on 5 June 2013**

### **Spectrally Agile Waveforms for Dynamic Spectrum Access**

Speaker: Alexander M. Wyglinski, Worcester Polytechnic Institute, USA

Date & Time: 5 June 2013 at 14:00 hrs

Location: Weicker Building -Room B001 Ground floor, 4 rue Alphonse Weicker, L-2721  
Luxembourg

University of Luxembourg, Interdisciplinary Center for Security Reliability and Trust.

<http://www.uni.lu/snt/>)

Directions: <http://wwwen.uni.lu/snt/contact>

Wireless communication networks enable all members of society to connect with each other. With the prevalence of cellular telephones, laptops with built-in WiFi, Bluetooth headsets, and other similar devices in our everyday world, we are totally immersed in communication technology. Moreover, our connectivity is almost entirely ubiquitous and its reach extends to the most remote corners of the planet. However, given the growing amount of wireless chatter and transmissions surrounding us across the airwaves, the ability for wireless technology to accommodate this amount of growth is quickly approaching a critical limit in terms of how many more devices can be supported across the same frequency within the context of the current regulatory framework used to simultaneously handle this plethora of wireless appliances. In this talk, we will examine one potential solution to this issue called "cognitive radio." Specifically, we will focus on digital transmission and digital signal processing techniques for enabling high-speed wireless data access across several non-contiguous frequency bands, including the presentation of several implementations and the latest research findings.

## **Tutorial in Twente on 6 June 2013**

### **Software Defined Radio and Cognitive Radio Implementations and Test-Beds**

Speaker: Alexander M. Wyglinski, Worcester Polytechnic Institute, USA

Date & Time: Thursday 6 June 2013 at 16:00 hrs

Location: University of Twente, Room 2H in Carré Building

Directions: <http://www.utwente.nl/en/contact/route/>. The Carré building is no. 15 on the Campus map,  
<http://www.utwente.nl/download/campusmap.pdf>. The closest parking place is P2.

Modern society depends on telecommunications in order to enable a diverse range of activities, such as financial transactions, public safety, education, and social networking. To achieve ubiquitous and robust last-mile access, many applications require some form of wireless transmission to connect the end-users with the rest of the network. However, several serious issues are beginning to emerge given society's growing dependence on wireless access. For instance, although the demand for wireless access based on the number of users and applications is rising steadily, the amount of freely-available electromagnetic spectrum is rather

limited and may not satisfy this need. Furthermore, new complex wireless networking architectures are becoming increasingly difficult to realize using conventional radio technology. Consequently, cognitive radio has been proposed as a viable solution to these issues. A cognitive radio is a type of wireless networking system that combines autonomous device operating parameter reconfigurability, real-time situational awareness of the radio/network/system environment, and artificial intelligence-driven decision-making for achieving the "best possible" parameter selection. This is all made possible by employing microprocessor technology at the core of a cognitive radio system in order to perform baseband digital signal processing and digital communication operations. In this talk, implementations of several subsystems that constitute a cognitive radio platform using software defined radio will be presented, including digital transmission and digital signal processing techniques for enabling high-speed wireless data access across several non-contiguous frequency bands, and the latest research findings in these areas will be presented.

### **Biography of the Lecturer:**

Dr. Alexander M. Wyglinski is internationally recognized as an expert in the field of wireless communications, specializing in cognitive and software-defined radio, dynamic spectrum access, cyber-physical systems and security, and wireless system optimization and adaptation. He is an Associate Professor of Electrical and Computer Engineering at Worcester Polytechnic Institute (WPI), Worcester, MA, Director of the Wireless Innovation Laboratory (WI Lab), and the Lead Investigator of the Cyber Physical and Secure Systems (CPASS) initiative at WPI. Dr. Wyglinski received his B.Eng. and Ph.D. degrees in 1999 and 2005 from McGill University, and his M.Sc.(Eng.) degree from Queen's University in Kingston in 2000, all in Electrical Engineering. Throughout his academic career, Dr. Wyglinski has published over 30 journal papers, over 75 conference papers, 9 book chapters, and two textbooks. Dr. Wyglinski's research activities have been or are currently being sponsored by organizations such as the Defense Advanced Research Projects Agency (DARPA), the Naval Research Laboratory (NRL), the Office of Naval Research (ONR), the Air Force Research Laboratory (AFRL) – Space Vehicles Directorate, The MathWorks, Toyota InfoTechnology Center U.S.A., and the National Science Foundation. Dr. Wyglinski is a Senior Member of the IEEE, as well as a member of Sigma Xi, Eta Kappa Nu, and the ASEE.