

# IEEE Serbia & Montenegro COM Chapter, Društvo za telekomunicacije - DT i Elektrotehnički fakultet u Beogradu

pozivaju Vas na interesantno predavanje:

**Naslov: BEAMFORMING YOUR DATA IN A TETHER-FREE WORLD**

**Predavač: Prof. dr VIJAY BHARGAVA, Distinguished Lecturer,  
IEEE COM Society**

**Vreme: Četvrtak, 29. septembar 2011., početak u 16:00 časova**

**Mesto: Sala 70, Elektrotehnički fakultet,  
Bul. kralja Aleksandra 73, Beograd**

## **ABSTRACT**

Current interest in 60 GHz millimetre-wave (mmW) systems is motivated by both old and new factors. Over the past decade, regulators have allocated up to 9 GHz of spectrum near 60 GHz for license-exempt world-wide use. The emergence of numerous high-speed applications, including uncompressed HDTV, uncompressed multi-video streaming, conference ad hoc and very-high-speed file downloading, has provided the motivation for developing the technologies required to exploit this bandwidth. Moreover, recent gains in realizing low-cost CMOS technology suitable for use at such high frequencies, improved algorithms for adaptively steering directive antenna beams; protocols for media access control (MAC) using directive antennas, and implementations of LDPC coding to improve link margins have made such exploitation a commercially viable prospect. In June 2011, the Wireless Gigabit Alliance released a 60 GHz standard that will deliver data transfer rates up to 7 Gbit/s, more than 10 times faster than the highest 802.11n rate while maintaining compatibility with existing Wi-Fi devices.

In this talk, we consider the technical challenges and opportunities for mmW indoor communications, with an emphasis on the PHY and MAC layers. Starting with an accurate and tractable characterization of indoor mmW channels that captures both temporal and angular dispersion due to reflections from walls, floors and ceilings as well as signal fading induced by human mobility, we introduce the coding, modulation and beam forming techniques tailored for this band. While established OFDM signaling and adaptive antenna techniques can be employed at the PHY layer, the profound differences in the mmW channel relative to the familiar WiFi bands will dictate fresh designs for network neighbour discovery and directional MAC protocols.

## **BIOGRAPHY**

Vijay Bhargava, an IEEE volunteer for three decades, is Professor in the Department of Electrical and Computer Engineering at the University of British Columbia in Vancouver, where he served as Department Head during 2003-2008. He served as the Founder and President of "*Binary Communications Inc.*" (1983-2000) and has provided consulting services to several companies and government agencies.

Vijay Bhargava is a co-author (with D. Haccoun, R. Matyas and P. Nuspl) of *Digital Communications by Satellite* (New York: Wiley: 1981) which was translated in Chinese and Japanese. He is a co-editor (with S. Wicker) of *Reed Solomon Codes and their Applications* (IEEE Press: 1994), a co-editor (with V. Poor, V. Tarokh and S. Yoon) of *Communications, Information and Network Security* (Kluwer: 2003), a co-editor (with E. Hossain) of *Cognitive Wireless Communication Networks* (Springer: 2007), a co-editor (with E. Hossain and D.I Kim) of *Cooperative Wireless Communications Networks*, (Cambridge University Press: 2011) and a co-editor (with E. Hossain and G. Fettweis) of *Green Radio Communication Networks* to be published by Cambridge University Press in 2012.

Vijay Bhargava has served on the Board of Governors of the IEEE Information Theory Society and the IEEE Communications Society. He has served as an Editor of the *IEEE Transactions on Communications*. He played a major role in the creation of the IEEE Communications and Networking Conference (WCNC) and *IEEE Transactions on Wireless Communications*, for which he served as the editor-in-chief during 2007, 2008 and 2009. During 2010, he served as IEEE Communications Society Director of Journals. He is a past President of the IEEE Information Theory Society.

Vijay Bhargava has been elected to serve as IEEE Communications Society President-Elect during 2011 and will serve as its President during 2012 and 2013.

**S poštovanjem, Prof. dr Đorđe Paunović**