University of Pavia

Ph.D. School of Electrical and Electronics Engineering and Computer Science
Ph.D. School in Microelectronics

Short Course

Cognitive radio and dynamic spectrum access

Prof. K.R. Chowdhury
Northestern University, Boston, MA

November 17th, 2015, h 14.00 – 18.00, room E8

Abstract: .Cognitive networks represent a relatively novel paradigm in which it is supposed that users device sense and understand the electromagnetic environment to become aware of the available transmission opportunities even in frequency intervals nominally assigned to other specific service. When available, cognitive devices may exploit these opportunities provided they vacate the channel as soon as a legitimate user starts transmission. Beside providing potential very high gains in terms of spectrum efficiency, cognitive radios and networks pose several challenges that will be described in the seminar. Topics covered:

- Introduction to cognitive radio, spectrum scarcity problem, network architectures
- Cognitive cycle and functional components
- Spectrum sensing: energy, feature detection, cooperative detection
- Link layer design and common control channel
- Routing protocols, both centralized, and distributed geographic forwarding and probabilistic approaches
- Transport layer protocol design, both TCP- and equation-based
- Standards and application

Bio: Kaushik Chowdhury is Associate Professor in the Electrical and Computer Engineering Department at Northeastern University, Boston, MA, USA since 2009. He graduated with B.E. in Electronics Engineering with distinction from VJTI, Mumbai University, India, in 2003. He received his M.S. in Computer Science from the University of Cincinnati, OH, in 2006, and Ph.D. from the Georgia Institute of Technology, Atlanta, GA in 2009. His M.S. thesis was given the outstanding thesis award jointly by the ECE and CS departments at the University of Cincinnati. He received the Best Paper Award at the IEEE ICC Conference in 2009, 2012, 2013, as well as the Best Paper award in the ICNC Conference in 2013. His expertise and research interests lie in wireless cognitive radio ad hoc networks, energy harvesting, and intra-body communication. He is currently an area editor for the Elsevier Ad Hoc and Computer Communications journals, and the Chair for the IEEE Technical Committee on Simulation. He is the recipient of the 2015 NSF CAREER award.

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Seminar in English
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