



**University of Pavia**

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

## **SEMINAR**

# **Wireless sensor networks: hardware, systems and advanced topics**

***Prof. K.R. Chowdhury***  
***Northeastern University, Boston, MA***

**November 12<sup>th</sup>, 2015, h 11.00 – 13.00, room E8**

**Abstract:** The focus of this seminar will be on the devices and specifically we will address the fundamental topic of energy consumption in a wireless sensors network. Since sensors are in general not connected to any external power source, they can only rely on their own batteries. When batteries run out, the sensor will cease functioning. In a network, this may imply loss of connectivity to the information collector and therefore the existence of a WSN is strictly tied to the lifetime of the batteries of its components. Modeling the behavior of the devices in terms of energy consumption is of help in designing efficient transmission techniques and networking protocols. Energy consumption can be at least partially relieved by the recently introduced concept of energy harvesting from ambient sources and from the received RF signal itself. Models and techniques to exploit the harvested energy will be described. Topics covered:

- Classification of existing sensor network hardware, limitations
- Energy models
- Circuit design and interfacing RF energy harvesting boards
- Energy harvesting sensor protocol design
- Models for energy usage, consumption

**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.

### **Organizer**

**Prof. L. Favalli**

### **Ph.D. Coordinator**

**Prof. P. Di Barba**  
**Prof. Franco Maloberti**

Seminar in English

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