Moving Forward in Wireless: Emerging Concepts and Technologies for Beyond-2020 Cellular Networks

Rhodes Hall 310: April 3, 2013 @ 12:00PM

ISN Seminar Speaker:
Halim Yanikomeroglu
Carleton University

Abstract

Since the standardization process for the 4G wireless technologies (LTE, LTE-Advanced) has recently been finalized, it is time for the research community to articulate on what is likely to come next.

Despite the profound advances in wireless technologies during the last few decades, the wireless community faces the challenge of enabling a further traffic increase of up to 1,000 times in the next 10 years or so, while no customer is willing to pay more for the wireless pipe itself: the so called "traffic-revenue decoupling". Moreover, many experts warn that the low-hanging fruits in wireless research (especially in information theory, communications theory, and signal processing) have already been collected. While the research community is full of ideas (as usual), many of these ideas are either not too relevant (i.e., not in the bottleneck areas) or they are in areas in which progress toward a tangible implementation is slow.

This talk will start with a brief overview of the state-of-the-art in cellular networks; then we will articulate on

- the bottleneck problems in beyond-2020 wireless networks,
- the potential research directions towards coping with these problems, especially in the context of radio access network (RAN), resource allocation, layers 1, 2, and 3, and
- the underlying mathematical tools.

In the absence of a clear technology roadmap towards 5G, the talk has, to a certain extent, an exploratory view point to stimulate further thinking and creativity. We are certainly at the dawn of a new era in wireless research and innovation; the next twenty years will be very interesting.

Biography

Halim Yanikomeroglu is a full professor at the Department of Systems and Computer Engineering at Carleton University, Ottawa, Canada. His research interests cover many aspects of wireless technologies with a special emphasis on cellular networks. Dr. Yanikomeroglu coauthored more than 50 journal and 160 conference papers, and has given more than 20 tutorials in leading international conferences on wireless technologies. In recent years, Dr. Yanikomeroglus research has been funded by Huawei, RIM, Samsung, Communications Research Centre of Canada (CRC), Telus, and Nortel. This collaborative research resulted in about 15 patent applications.

Dr. Yanikomeroglu is a member of the Steering Committee of the IEEE Wireless Communications and Networking Conference (WCNC). He served or will serve as the Technical Program Chair or Co-Chair of WCNC 2004, WCNC 2008, and WCNC 2014. He was the General Co-Chair of the IEEE Vehicular Technology Conference Fall 2010. Dr. Yanikomeroglu has served in the editor boards of IEEE TCOM, IEEE TWC, and IEEE CST. He is a former chair of the IEEE's Technical Committee on Personal Communications (now called, Wireless Technical Committee). Dr. Yanikomeroglu is a recipient of several teaching and research excellence awards. He is a Distinguished Lecturer for the IEEE Vehicular Technology Society.